HYNES AUDITORIUM EXPANSION

BOSTON, MASSACHUSETTS

Final Report (Volume I)

Architectural & Engineering Summary

CITY OF BOSTON
Kevin H. White, Mayor

BOSTON REDEVELOPMENT AUTHORITY
Robert J. Ryan, Director

PUBLIC FACILITIES DEPARTMENT
Donald B. Manson, Director

Final Report (Volume I)

Architectural & Engineering Summary

prepared by

ARCHITECTS
Kallmann, McKinnell & Wood, Architects, Inc.
Boston, Massachusetts

with

CODE/FIRE PROTECTION
Firepro, Inc.
Wellesley Hills, Massachusetts

SOILS
Haley & Aldrich, Inc.
Cambridge, Massachusetts

STRUCTURAL
Weidlinger Associates
Cambridge, Massachusetts

H.V.A.C.
TMP Consulting Engineers, Inc.
Boston, Massachusetts

PLUMBING
Robert W. Sullivan, Inc.
Boston, Massachusetts

ELECTRICAL
Lottero & Mason Associates, Inc.
Boston, Massachusetts

February 1983

Final Report (Volume I)

Architectural & Engineering Summary

Table of Contents

Introduction

Kallmann, McKinnell & Wood, Architects, Inc. was retained by the Boston Redevelopment Authority and the Public Facilities Department for the design of the Hynes Auditorium Expansion in April of 1982.

The design process for the expansion consisted of three stages:

1. Reconnaissance
2. Preliminary Development
3. Final Space Program/Conceptual Design

The following report, organized into four volumes, represents the work of the Architects and their Consultants in that design process.

Volume I - Architectural and Engineering Summary:

1. Existing Conditions and Development
2. Summary of Tour to Competitive Facilities

The first of these sections contains the reports of the seven disciplines involved in the design process. Each report deals with the following issues:

1. Existing Conditions
2. Proposed Expansion
3. Options and Recommendations
4. Phasing

Volume II (A)(B)(C) - Support Documentation:

Consists of technical back-up information, such as surveys, investigations and calculations used in the design process and serves as support for the contents of Volume I.

Volume III - Cost Analysis: (Hanscomb Associates, Inc.)

The estimate will identify separately the following elements:

1. Renovation of Existing Facility
2. New Construction within Property Line
3. New Construction in front of Commercial Block "C"
4. New Construction on Roof of Hynes
5. Demolition & New Construction in Commercial Block "C" & West Court
6. Escalation
7. Phasing Premium

VOLUME IV - ADDITIONAL INVESTIGATIONS:

Proposals for further investigatory work requested by the City.


BOSTON

Architectural

1. Existing Conditions & Development

Kallmann, McKinnell & Wood, Architects, Inc.

HYNES AUDITORIUM EXPANSION

ARCHITECTURAL INDEX

1. EXISTING CONDITIONS AND DEVELOPMENT

   A. EXISTING CONDITIONS

      . SITE

      . LOWER LEVEL

      . MAIN LEVEL

      . UPPER LEVEL

   B. PROPOSED EXPANSION

      . PRELIMINARY DEVELOPMENT

      . FINAL DEVELOPMENT

   C. OPTIONS AND RECOMMENDATIONS

      . THE PROPOSAL

      . MEETING ROOMS

      . EXHIBIT SPACE

      . AUDITORIUM

      . PRE-FUNCTION/CIRCULATION

      . GOODS FLOW

      . PLANS AND SECTIONS

   D. PHASING

      . PHASE 1

      . PHASE 2

      . PHASE 3

SUMMARY

It is the consensus of the design/space programmer team, advisory committees and City officials that the Hynes Auditorium can be reconstructed and expanded into a nationally competitive convention facility capable of accommodating at least 90% of the convention market.

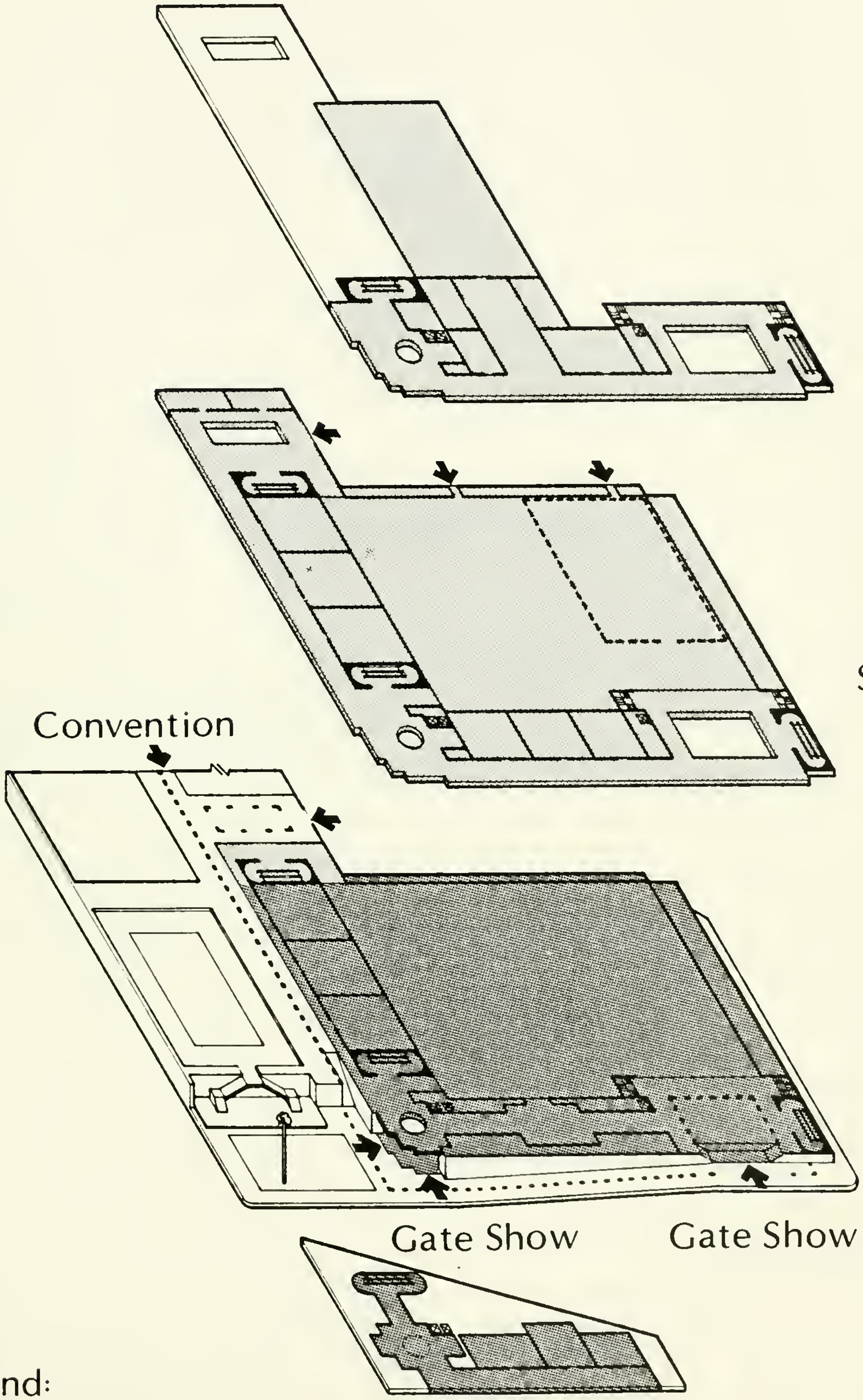
The proposed project is made possible because of two key elements: the availability of adjacent land area for expansion, and the feasibility of adapting the existing Hynes infrastructure to serve the new facility.

The proposed expansion will wrap the existing structure with new lobby, circulation and meeting room areas, while accommodating expansion of the exhibit space. Existing foundations, loading and infrastructure elements will be utilized and adapted where needed to provide for this expansion.

In response to the requirements of the space program, a major feature of the new Hynes Auditorium will be its ability to operate on concurrent or overlapping schedules of two or more events. Through this increased utilization, hotels will be able to minimize the current cyclical nature of bookings.

The following flow diagrams indicate how Hynes might be subdivided to meet the market demands for the various types of space.

SIMULTANEOUS USE DIAGRAM I



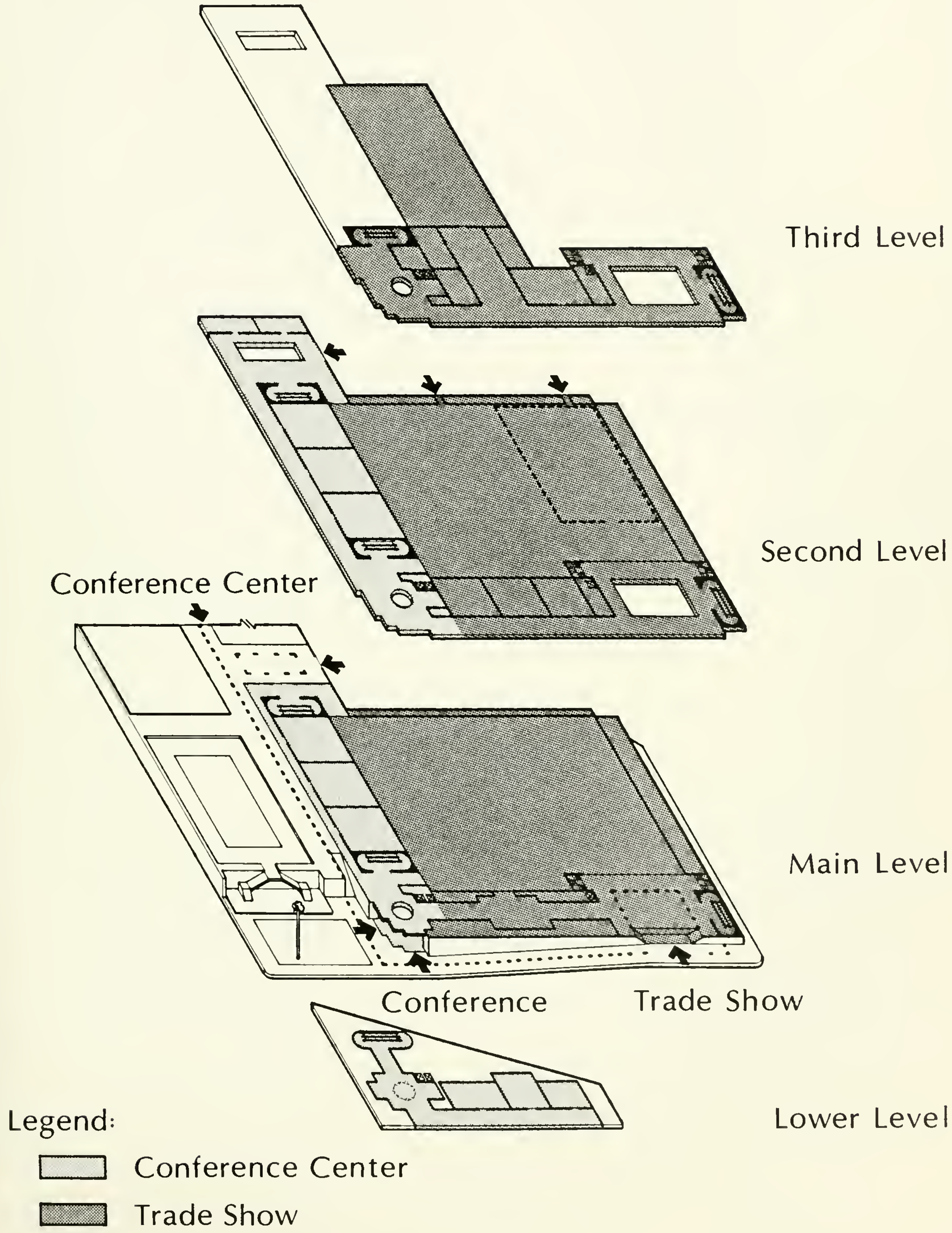
Legend:

Convention

Gate Show

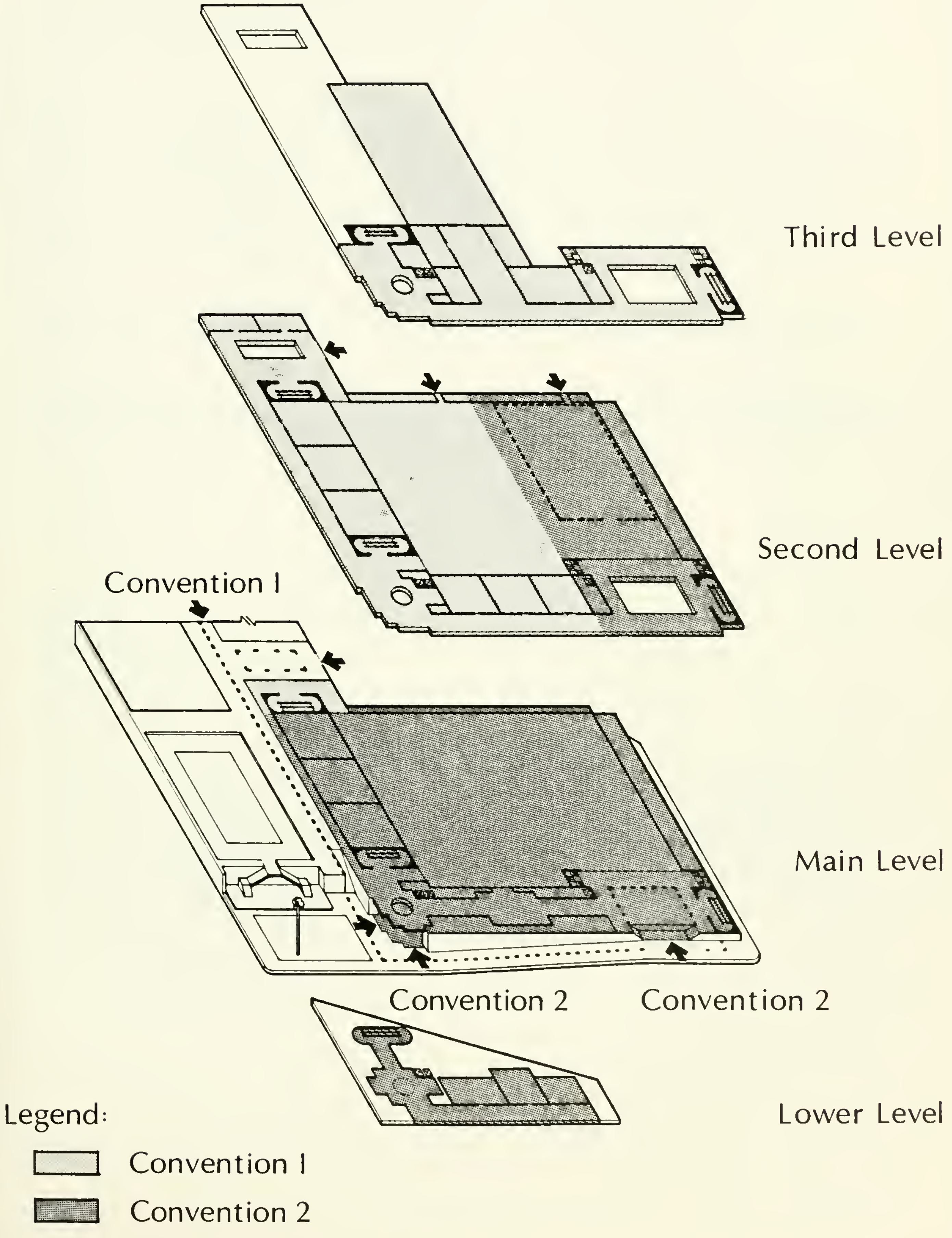
SIMULTANEOUS USE

DIAGRAM II



SIMULTANEOUS USE

DIAGRAM III



A. EXISTING CONDITIONS

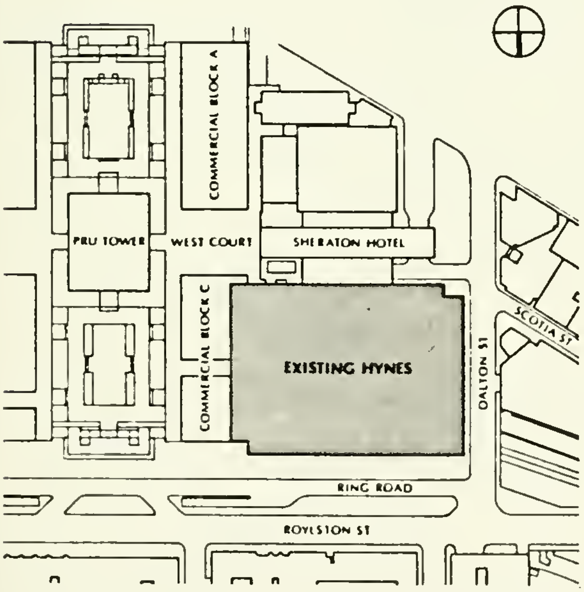
The following section summarizes the existing facility and its site. A more detailed account is found in Volume II - Support Documentation of the Final Report.

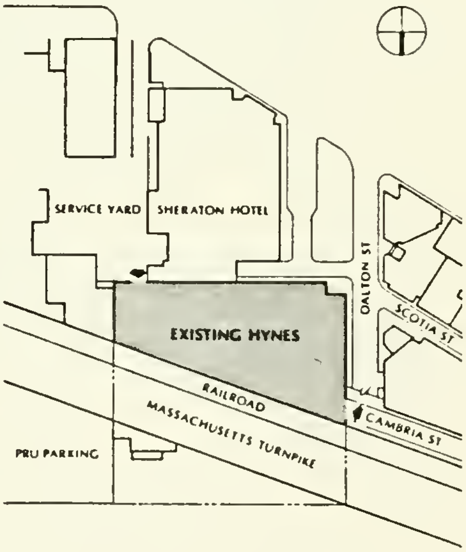
Site

The site, recently acquired from the City of Boston by the State, consists of four acres located at the northwest corner of the Prudential complex at the corner of Boylston and Dalton Streets. It is bound to the north by Boylston Street, the east (adjacent to the Hynes) by retail stores owned by the Prudential Insurance Company and referred to as Commercial Block "C", the south by the Sheraton Hotel and the west by Dalton Street.

The existing facility presently occupies three quarters of the site, with the remaining portion to the north being allocated to Ring Road.

The site is bisected at the lower level of the Hynes by the Massachusetts Turnpike and railroad easements, thereby separating the lower portion of the Hynes from the Boylston Street Frontage.

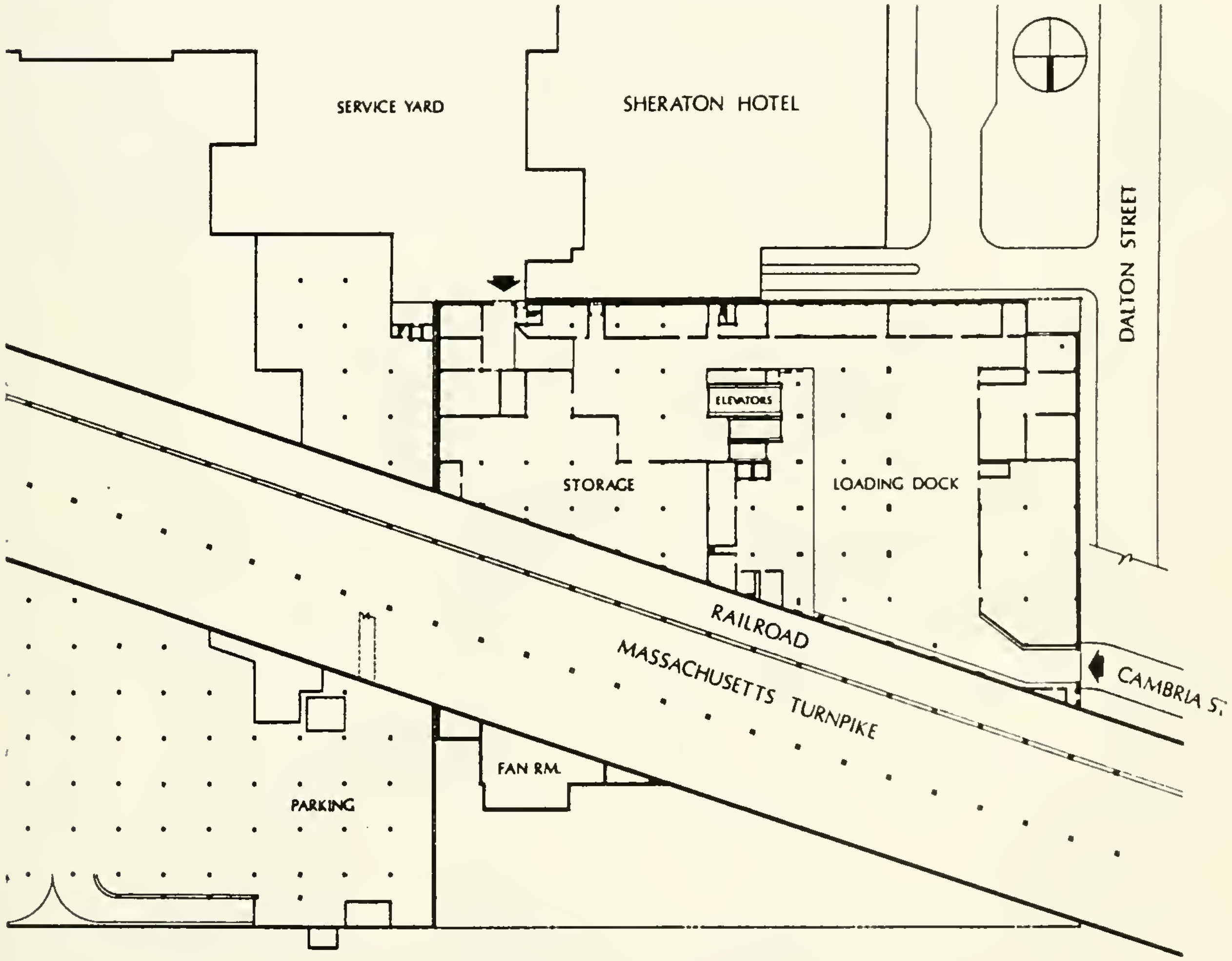




EXISTING CONDITIONS

Lower Level

The lower level is the level from which the existing facility is serviced. Located at this level are the mechanical, shipping/receiving and storage spaces. Vehicular access to the lower level is gained by entrances at Cambria Street and from Huntington Avenue through the Prudential Garage, although the latter has not been used in recent years due to the limited amount of maneuverability afforded. The transportation of goods from this to other levels of the facility is accomplished by five hydraulic freight elevators, the largest of which can accommodate a fully loaded tractor trailer up to 37.5 tons.

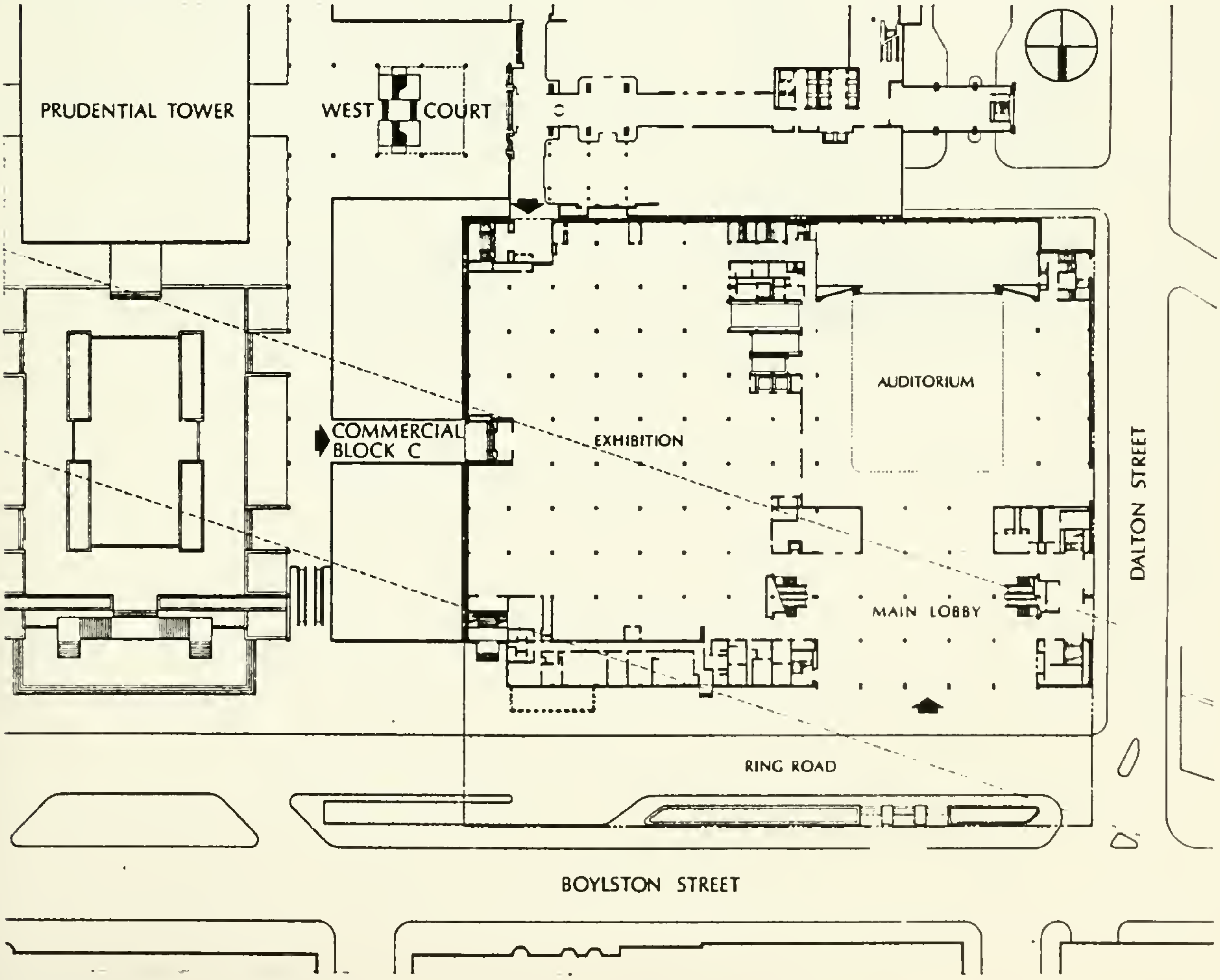


EXISTING CONDITIONS

Main Level

The main level consists of 132,000 sq. ft. The two major elements of this level are the Exhibition Hall (59,000 sq. ft.) and the Auditorium (30,000 sq. ft.). The Exhibition Hall has a 14'-3" clear ceiling height and columns spaced 30' apart throughout, while the Auditorium provides a column-free area with a 50' ceiling height. The Exhibition Hall has the ability to provide eight modular Meeting Rooms within its area. These temporary Meeting Spaces range in area from 1,700 - 3,000 sq. ft. The Auditorium when used for assembly purposes can seat approximately 5,100 people, 3,300 at floor level and 1,800 in the balcony. Doubling as Exhibition Space, the Auditorium creates the potential for 89,000 sq. ft. of Exhibition Space at this level.

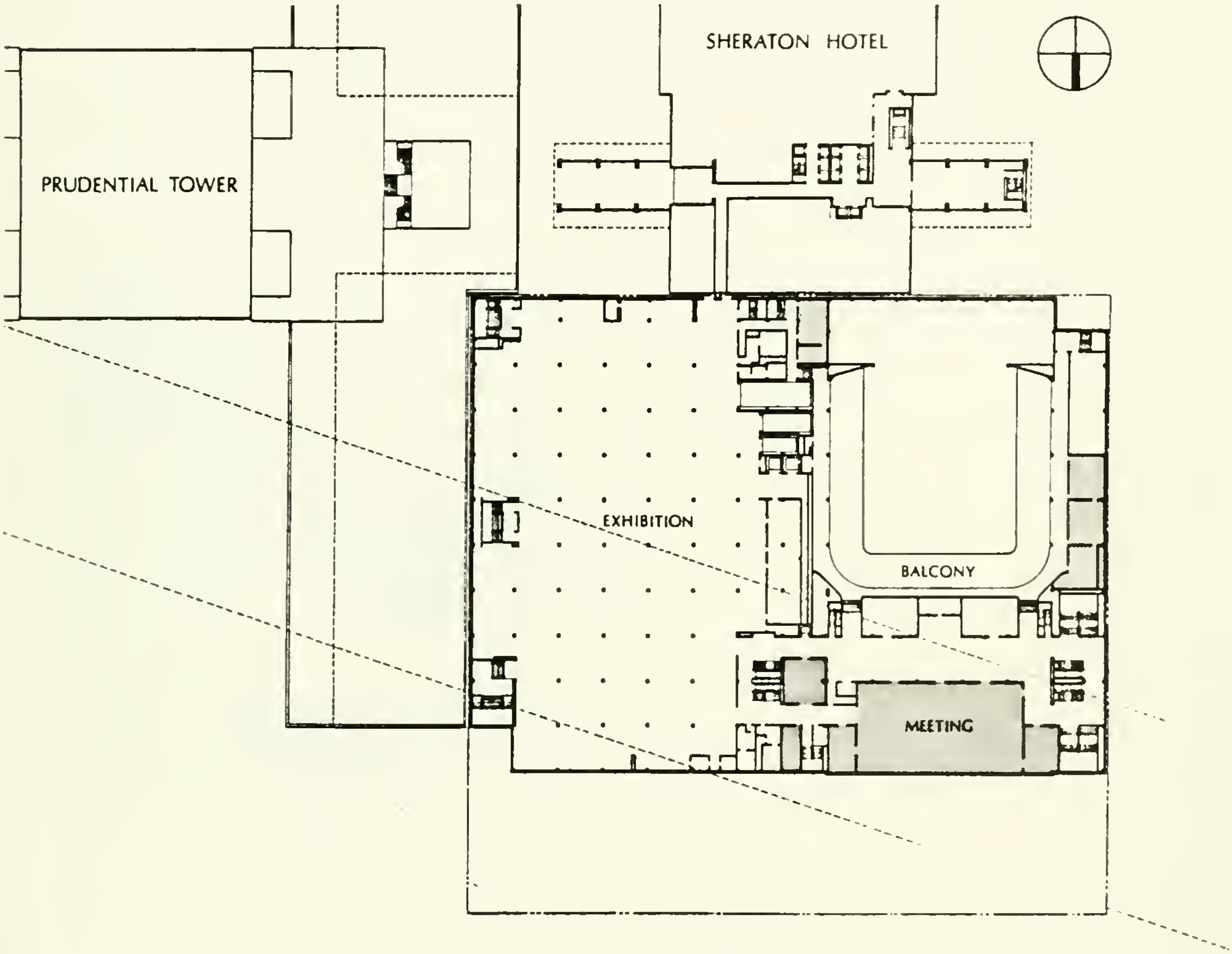
Also located at this level is the Main Lobby (17,400 sq. ft.). Serving as the major entrance to the Hynes, the Lobby provides access to the Auditorium and Exhibition Halls located at both levels. Direct access to the Auditorium and Exhibition Hall is provided at the main level, while access to the upper level Exhibition Area, Meeting Rooms and Auditorium balcony is gained by pairs of escalators and stairs provided at the east and west ends of the Lobby. Secondary entrances are located at the east side and southeast corner of the Exhibition Hall, but are primarily used as fire exits.



EXISTING CONDITIONS

Upper Level

Located at this level, and consisting of ten rooms ranging in size from 260 - 6,600 sq. ft., is the only permanent Meeting Space provided by the Hynes. Additionally, there exists an Exhibition Hall of 52,400 sq. ft. with provisions for creating five temporary Meeting Rooms within its area. Occupying the balance of this level is the balcony of the Auditorium.



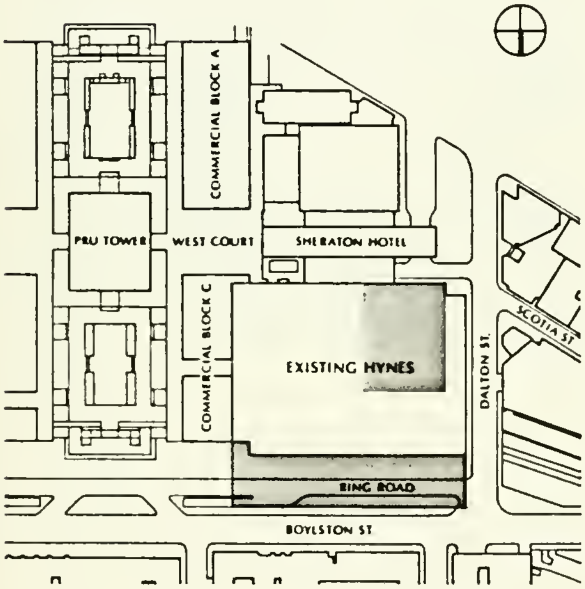
B. <u>OPPORTUNITIES AND CONSTRAINTS</u>

<u>Preliminary Development</u>

The first phase in the development process began with a reconnaissance of the existing facility, its site and adjacent properties. Engineering issues associated with each were identified. Next a series of studies were generated for the purposes of determining the net square footage that could be captured when expansion was contained solely within the boundaries of the existing site. Key items identified in this process were:

1. Ability to expand in the Ring Road area with a 3-4 story addition.

2. Ability to fill in the Auditorium balcony for exhibit space.



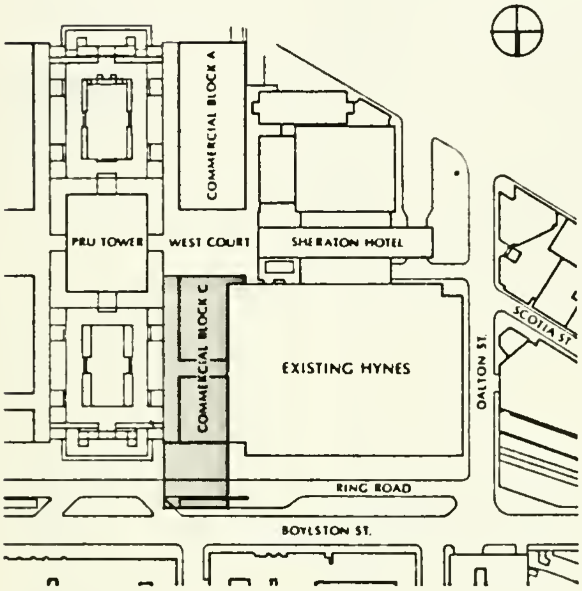
B. OPPORTUNITIES AND CONSTRAINTS

Preliminary Development

Adjacent properties were investigated for additional development:

- Area in front of Commercial Block "C", fronting Boylston Street, consisting of 11,436 sq. ft.

- Commercial Block "C", containing 36,450 sq. ft.



B. OPPORTUNITIES AND CONSTRAINTS

Preliminary Development

Programs, based on the gross square footages identifed in the reconnaissance, were generated for progressively larger options for development. Working with the space programmers, this iterative process led to the initial presentation of three development schemes.

SCHEME I

Proposed the construction of a four level addition solely within the City of Boston property. A major component of this alternative was the filling in of the Auditorium at the second floor and relocation of this assembly space to the newly constructed area. Efforts to lessen the loads placed on the Turnpike support structures under the proposed construction led to the introduction of light wells in the grand lobby. Added to the existing facility were 119,000 sq. ft. with additional lobby and meeting space in the Ring Road addition and major points of entry at the upper and lower ends of Boylston Street.

SCHEME II

Increase in meeting and exhibition areas along with limited access from the Prudential Plaza were realized with the addition of the property in front of Commercial Block "C".

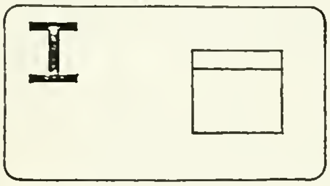
SCHEME III

The limitation of the existing retail structure, known as Commercial Block "C", to support additional loading together with the restrictions placed on construction over the Turnpike and Prudential garage resulted in the proposal of an all new two level meeting room wing. The proposed alternative provided the addition of 198,000 sq. ft. to the existing facility.

B. OPPORTUNITIES AND CONSTRAINTS

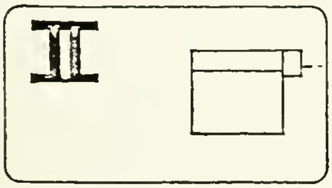
Preliminary Development

PRELIMINARY DEVELOPMENT



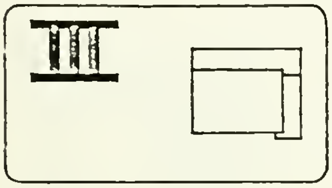
SPACE	PROVIDED	PROGRAM	DIFF.
MEETING	28,500±	35,000±	-6,500±
CONF/EXH.	13,500±	25,000±	-11,500±
EXHIBIT	204,000±	175,000±	-29,000±
LOBBY/ PRE FUNC/ CIRC.	58,500±	52,500±	+6000±

ACQUISITIONS	RETAIL (NET CHANGE)	COST
NONE	NONE	36.0M.



SPACE	PROVIDED	PROGRAM	DIFF.
MEETING	32,500±	40,000±	-7500±
CONF/EXH.	16,000±	25,000±	-9000±
EXHIBIT	205,000±	200,000±	-5000±
LOBBY/ PRE FUNC/ CIRC.	84,000±	60,000±	+24000±

ACQUISITIONS	RETAIL (NET CHANGE)	COST
LAND 11000±	NONE	42.5M.
PARKING 1000±		
TOTAL 12,000±		



SPACE	PROVIDED	PROGRAM	DIFF.
MEETING	42,500±	50000±	-7500±
CONF./EXH.	16,000±	30000±	-14000±
EXHIBIT	224,000±	240,000±	-16000±
LOBBY/ PRE FUNC/ CIRC.	102,000±	70,000±	+32,000±

ACQUISITIONS	RETAIL (NET CHANGE)	COST
LAND 11,000±	-28000±	50.0M.
PARKING 1000±		
COMM. BLK."C" 37,000±		
TOTAL 49,000±		

Presentation to the Auditorium Commission staff, the Greater Boston Convention and Tourist Bureau, and the Hotel and User Advisory Committees resulted in the identification of scheme deficiencies.

Schemes I and II were considered totally inadequate and incapable of meeting industry needs.

Scheme III, although the favored scheme, was cited as having major deficiencies. Of paramount concern was the insufficient amount of exhibit and meeting space provided and the absence of a multi-purpose room of 30,000 sq. ft. The lack of adequate lobby and circulation areas at Plaza level was also noted. As many convention attendees will be coming from the new hotels across Huntington Avenue, a lobby connection at Plaza level would provide convenient entry, while also facilitating the subdivision of the facility, permitting the functioning of several conventions concurrently.

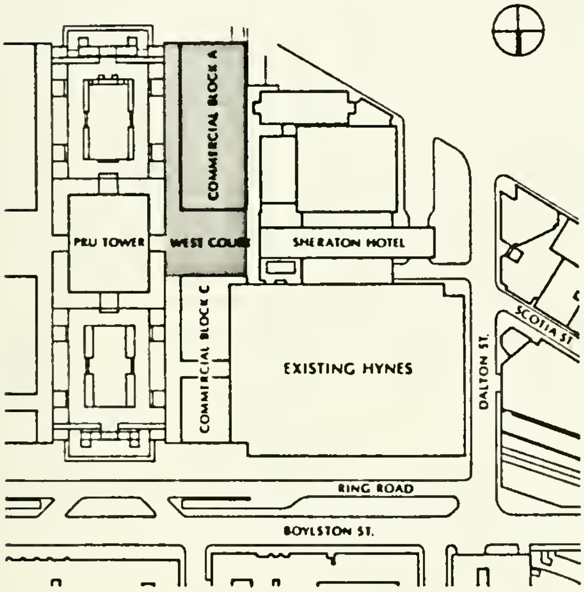
B. OPPORTUNITIES AND CONSTRAINTS

Final Development

The elimination of the inadequacies identified in the initial presentation led to the generation of the final seven development alternatives. These options ranged in size from an initial plan of building solely within Ring Road property to an alternative which in addition to those properties previously included encompassed:

- West Court - An open area of 18,000 sq. ft., owned by the Prudential Insurance Company, which provides for pedestrian circulation from the Sheraton Hotel to the Prudential Tower and shopping arcade.

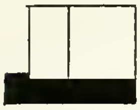
- Commercial Block A - Located adjacent to the West Court and extending to the escalators at the Huntington Avenue entrance. Containing 45,000 sq. ft., this former retail space is currently sub-divided into office space.



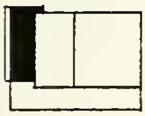
Key to this phase of development was the introduction of a third level conference/exhibit space over the existing second floor Exhibition Hall, and the assumption by the City that as an expansion project the existing facility would not need to be brought into compliance with present seismic requirements. As a result, all schemes presented proposed the construction of this third level space.

B. OPPORTUNITIES AND CONSTRAINTS

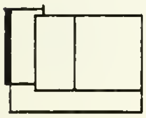
Final Development



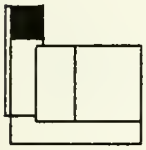
2



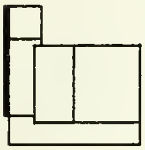
3



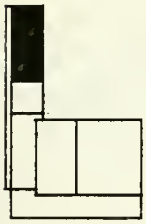
3A



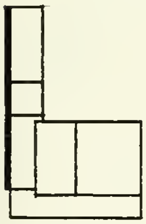
4



4A



5



5A

Presented to the Hotel and User Advisory Committees, the City and the Prudential Insurance Company, the development alternatives were reviewed and evaluated in terms of the established goals for the expansion, as well as the costs and impact which this construction would have on the adjacent property.

The alternatives presented ranged in size from an initial plan of building solely within Ring Road property to an alternative which encompassed building within all of the development areas identified, including the Ring Road Commercial Block "C", the West Court, and Commercial Block "A". All schemes included the Auditorium infill at the upper level and a third floor Conference/Exhibit Hall.

In order to provide more meeting and circulation space on the second floor above commercial space on the second floor above Commercial Block "C", in Schemes 3A, 4A and 5A, construction at the second floor was extended an additional 30' to align with the exterior wall at Plaza level. Increases in the net to gross square footage realized, and the negligible impacts on the adjacent properties, led to the conclusion that construction at the second level should be the full depth of the property.

Schemes 5 and 5A proposed the construction of meeting space over Commercial Blocks "C" and "A", with existing retail space remaining at Plaza level.

Considered in some detail were Alternatives 2 and 5A. While the least expensive, Scheme 2 did not provide an adequate amount of meeting space (37,000 sq. ft.), and lacked convenient attendee access from the Plaza level. The additional amount of meeting space provided in Scheme 5A was considered to be excessive, as the new hotels in Copley Place would also be providing new meeting space. Problems related to the travel distances required to service the meeting space over Commercial Block "A" were also cited.

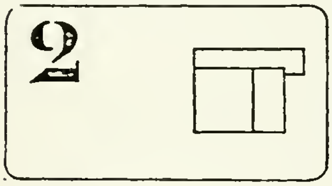
The unanimous consensus of the consultants and advisory groups was a preference for Alternative 4A. This alternative maximized the amount of meeting space and provided for excellent pedestrian connections to the Sheraton Hotel, the West Court lobby, and new meeting space to be constructed on the Prudential Plaza level. The construction cost of this alternative was estimated to be $70.8 million in today's dollars.

NOTE: Black areas in each diagram indicate new areas added to previous alternative.

B. OPPORTUNITIES AND CONSTRAINTS

Final Development

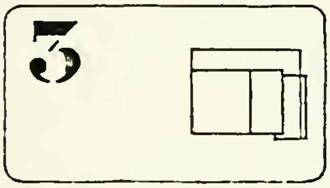
FINAL DEVELOPMENT



SPACE	PROVIDED	PROGRAM (SCHEME III)	DIFF.
MEETING	37,000♦	50,000♦	-13,000♦
BALLROOM	27,000♦	30,000♦	-3,000♦
EXHIBIT	204,000♦	240,000♦	-36,000♦
LOBBY/ PRE-FUNC/ CIRC.	123,000♦	110,000♦	+13000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
TOTAL	12000♦

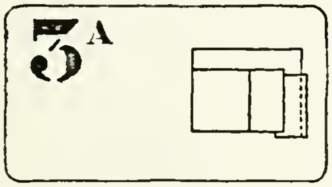
RETAIL (NET CHANGE)	COST
-3000♦	56.5 M.



SPACE	PROVIDED	PROGRAM (SCHEME III)	DIFF.
MEETING	55,000♦	50,000♦	+5000♦
BALLROOM	32,000♦	30,000♦	+2000♦
EXHIBIT	210,000♦	240,000♦	-30,000♦
LOBBY/ PRE FUNC/ CIRC.	145,000♦	110,000♦	+35,000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
COMM. BLK."C"	37000♦
TOTAL	49000♦

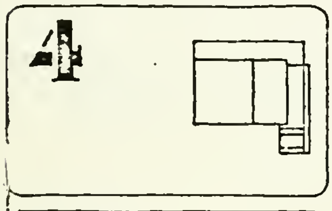
RETAIL (NET CHANGE)	COST
-28000♦	65.4 M.



SPACE	PROVIDED	PROGRAM SCHEME III	DIFF
MEETING	63000♦	50000♦	+13000♦
BALLROOM	32000♦	30000♦	+2000♦
EXHIBIT	210,000♦	240 000♦	-30 000♦
LOBBY/ PRE FUNC./ CIRC.	146,000♦	110 000♦	+36000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
COMM BLK."C"	37000♦
TOTAL	49000♦

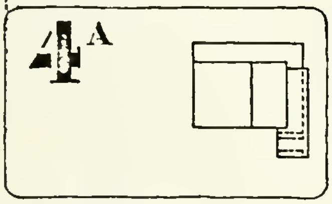
RETAIL (NET CHANGE)	COST
-28000♦	66.3 M.



SPACE	PROVIDED	PROGRAM (SCHEME III)	DIFF.
MEETING	62000♦	50 000♦	+12000♦
BALLROOM	32000♦	30 000♦	+ 2000♦
EXHIBIT	210,000♦	240,000♦	-30,000♦
LOBBY/ PRE FUNC./ CIRC.	152000♦	110,000♦	+42,000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
COMM. BLK."C"	37000♦
WEST COURT	18000♦
TOTAL	67000♦

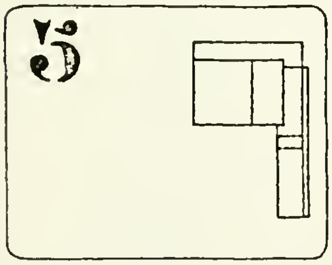
RETAIL (NET CHANGE)	COST
-21000♦	69.1 M.



SPACE	PROVIDED	PROGRAM SCHEME III	DIFF.
MEETING	71000♦	50000♦	+21000♦
BALLROOM	32000♦	30000♦	+2000♦
EXHIBIT	210000♦	240000♦	-30000♦
LOBBY/ PRE FUNC./ CIRC.	155000♦	110000♦	+45000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
COMM. BLK."C"	37000♦
WEST COURT	18000♦
TOTAL	67,000♦

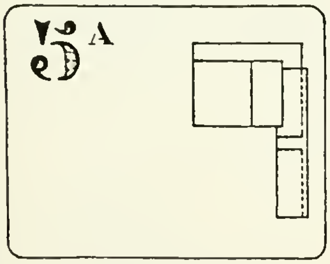
RETAIL (NET CHANGE)	COST
-21000♦	70.8 M.



SPACE	PROVIDED	PROGRAM (SCHEME III)	DIFF.
MEETING	67000♦	50000♦	+17000♦
BALLROOM	27000♦	30000♦	-3000♦
EXHIBIT	204000♦	240000♦	-36000♦
LOBBY/ PRE-FUNC./ CIRC.	148000♦	110,000♦	+48,000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
COMM. BLK."C"	37000♦
WEST COURT	18000♦
COMM BLK."A"	49000♦
TOTAL	112,000♦

RETAIL (NET CHANGE)	COST
+1000♦	77.1 M.



SPACE	PROVIDED	PROGRAM (SCHEME III)	DIFF.
MEETING	80 000♦	50000♦	+30000♦
BALLROOM	27 000♦	30000♦	-3000♦
EXHIBIT	204 000♦	240000♦	-36000♦
LOBBY/ PRE FUNC./ CIRC.	153000♦	110 000♦	+43000♦

ACQUISITIONS	
LAND	11000♦
PARKING	1000♦
COMM. BLK."C"	37000♦
WEST COURT	18000♦
COMM. BLK."A"	49000♦
TOTAL	112,000♦

RETAIL (NET CHANGE)	COST
+1000♦	79.5 M

C. OPTIONS AND RECOMMENDATIONS

The Proposal:

The Hynes expansion will more than double the size of the current facility from 326,000 to a total of 702,000 sq. ft. by adding both Exhibit and Meeting Space and new areas for Lobby, Circulation, Food Preparation and Storage.

The existing facility has only one Lobby entrance off Boylston Street. There is only one major Meeting Room in the entire facility.

The proposed expansion will create three entrances, two along Boylston Street and a third in the Prudential West Court. The Lobby areas will facilitate the use of the Hall by two or three conventions concurrently. Ground floor Exhibit Space will be enlarged by moving the Auditorium to the second floor and creating new Lobby and Administrative Office Areas in the Ring Road addition. A second major Meeting Room will be constructed on the roof of the second floor Exhibit Hall.

A special Conference Meeting Facility will be created in Commercial Block "C" and additional Meeting Space will be located in the Ring Road lower level.

Food Preparation and Warming Areas will serve all Meeting Rooms. Service access to all floors will be improved by providing new elevators and storage areas on each level.

Area	Existing Space	Addition	Total
Exhibit	104,000	64,000	168,000
Main Level	52,000	53,000	105,000
Second Floor	52,000	11,000	63,000
Auditorium/Exhibit	36,000	6,000	42,000
TOTAL EXHIBIT	140,000	70,000	210,000
MEETING	12,000	60,000	72,000
Conference/Exhibit	-	36,000	36,000
Kitchen	-	11,000	11,000
Pre-Function/Circulation	16,000	100,000	116,000
Lobby	17,000	35,000	52,000
Support	100,000	55,000	155,000
Basement Drive	41,000	8,000	49,000
TOTAL	326,000	375,000	701,000

MEETING ROOMS

The most significant change is the construction of 96,000 sq. ft. of additional Meeting Space. Beginning at the basement level of Ring Road and continuing on each floor of the Exhibit Hall, including a new roof level, are located a total of 39 new Meeting Rooms which can accommodate from 100 to 4,000 persons. In addition, the new second floor Auditorium can seat with the balcony included upwards of 4,000 persons.

The Meeting Rooms will be designed with special amenities: multi-use lighting, sound-proof walls, carpeting, audio-visual equipment, including two-way cable television hook-up and satellite connections. Access to a service corridor will facilitiate chair, food and beverage set-ups and many of the rooms can be divided into different size configurations.

An additional feature is that the Meeting Rooms on the second floor above Commercial Block "C" can be rented as a special Conference Center Facility with its own lobby, pre-function spaces and service access to various food preparation and warming areas.

PRELIMINARY MEETING ROOM SCHEDULE

LEVEL	AREA PER LEVEL	QUANTITY OF ROOMS	WIDTH	DEPTH	AREA	THEATRE[1] CAPACITY	BANQUET[2] CAPACITY
LOWER LEVEL (El. 10'-0") Meeting Rooms	10,700 s.f.	1	90' X	47'	4,224 s.f.	528	282
		(3)	30' X	47'			
		1	60' X	64'	3,840 s.f.	480	256
		(2)	30' X	64'			
		1	60' X	44'	2,640 s.f.	330	176
		(2)	30' X	44'			
MAIN LEVEL (El. 34'-10") Meeting Rooms	12,600 s.f.	1	60' X	60'	3,600 s.f.	450	240
		(2)	30' X	60'			
		1	54' X	60'	3,240 s.f.	405	216
		1	96' X	60'	5,760 s.f.	720	384
		(3)	32' X	60'			
SECOND LEVEL (El. 54'-10") Meeting Rooms	34,900 s.f.	1	30' X	30'	900 s.f.	113	60
		1	60' X	30'	1,800 s.f.	225	120
		(2)	30' X	30'			
		1	60' X	30'	1,800 s.f.	225	120
		(2)	30' X	30'			
		1	98' X	80'	7,840 s.f.	980	523
		(2)	49' X	80'			
		1	120' X	80'	9,600 s.f.	1,200	640
		(3)	40' X	80'			
		1	60' X	60'	3,600 s.f.	450	240
		(2)	30' X	60'			
		1	60' X	60'	3,600 s.f.	450	240
		(2)	30' X	60'			
		1	90' X	60'	5,400 s.f.	675	360
		(3)	30' X	60'			
THIRD LEVEL (El. 74'-10") Meeting Rooms	13,700 s.f.	1	60' X	45'	2,700 s.f.	338	180
		(2)	30' X	45'			
		1	60' X	45'	2,700 s.f.	338	180
		(2)	30' X	45'			
		1	60' X	45'	2,700 s.f.	338	180
		(2)	30' X	45'			
		1	93' X	60'	5,580 s.f.	698	372
		(3)	31' X	60'			
CONFERENCE/ EXHIBIT	36,000 s.f.	1	150' X	240'	36,000 s.f.	4,500	2,400

TOTAL MEETING: 71,900 s.f.

TOTAL CONFERENCE/EXHIBIT: 36,000 s.f.

[1] Theatre Capacity at 8 s.f. Per Person

[2] Banquet Capacity at 15 s.f. Per Person

EXHIBIT SPACE

The Exhibit Hall contains on two levels some 210,000 sq. ft. of space. In addition, the third floor Conference Room could also be utilized for light exhibits for a total of 246,000 sq. ft. The existing facility has only 150,000 sq. ft. of Exhibit Space.

The ceiling heights and loading capacities of the existing facility will continue. The utility services will be updated in the renovation. New storage areas will be created around the perimeter of the Hall.

AUDITORIUM

The new Auditorium located on the second floor will serve more efficiently as a general assembly hall capable of seating some 4,000 persons. A large Lobby will separate the Auditorium from general circulation on the second floor. The stage will be set up only when needed. Chairs will be stored along the perimeter wall to facilitate set-up and take-down. Currently, the chairs have to be transported up from the basement; a 6 hour job which restricts utilization of the elevator for exhibit set-ups. The Auditorium will have a column-free, 30' high ceiling in contrast to a 50' ceiling which currently exists. Food warming and kitchen preparation areas will be directly accessible to the Auditorium. The Auditorium, if desired, could also be utilized for Exhibit Space and the third floor Meeting Room utilized, if needed, as the general assembly hall.

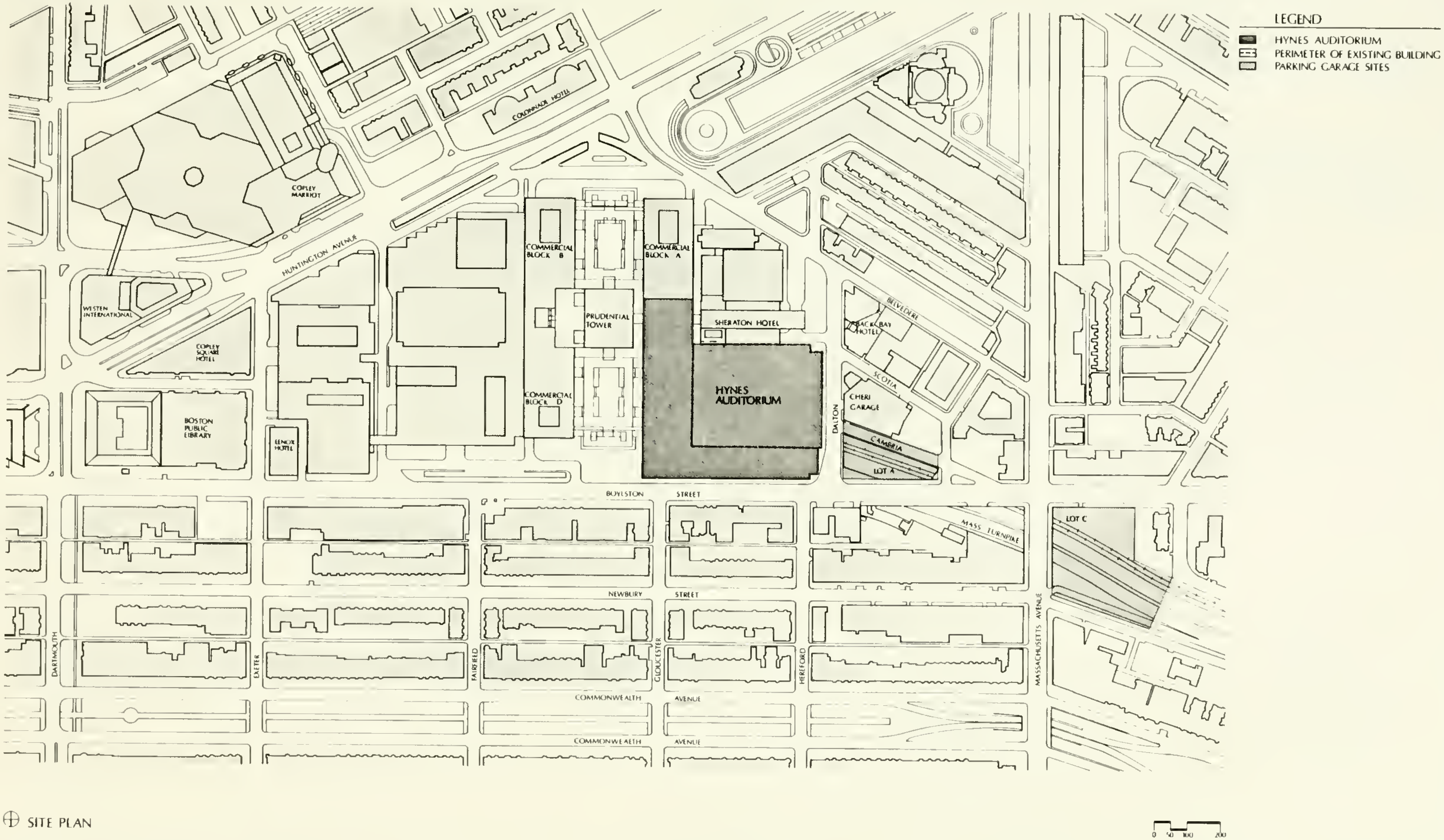
PRE-FUNCTION/CIRCULATION

The existing facility has only one major Meeting Room. Access to this room on the second floor is from a pre-function corridor which also services the Auditorium balcony.

The expanded Hynes will include a significant amount of Meeting Space. Corridors and gathering areas (pre-Function space) outside these Meeting Rooms must be provided to serve these Meeting Rooms. Pre-function/circulation space must also be provided so as to inter-connect the various lobby areas which will facilitate sub-dividing the Hall for several concurrent events.

GOODS FLOW

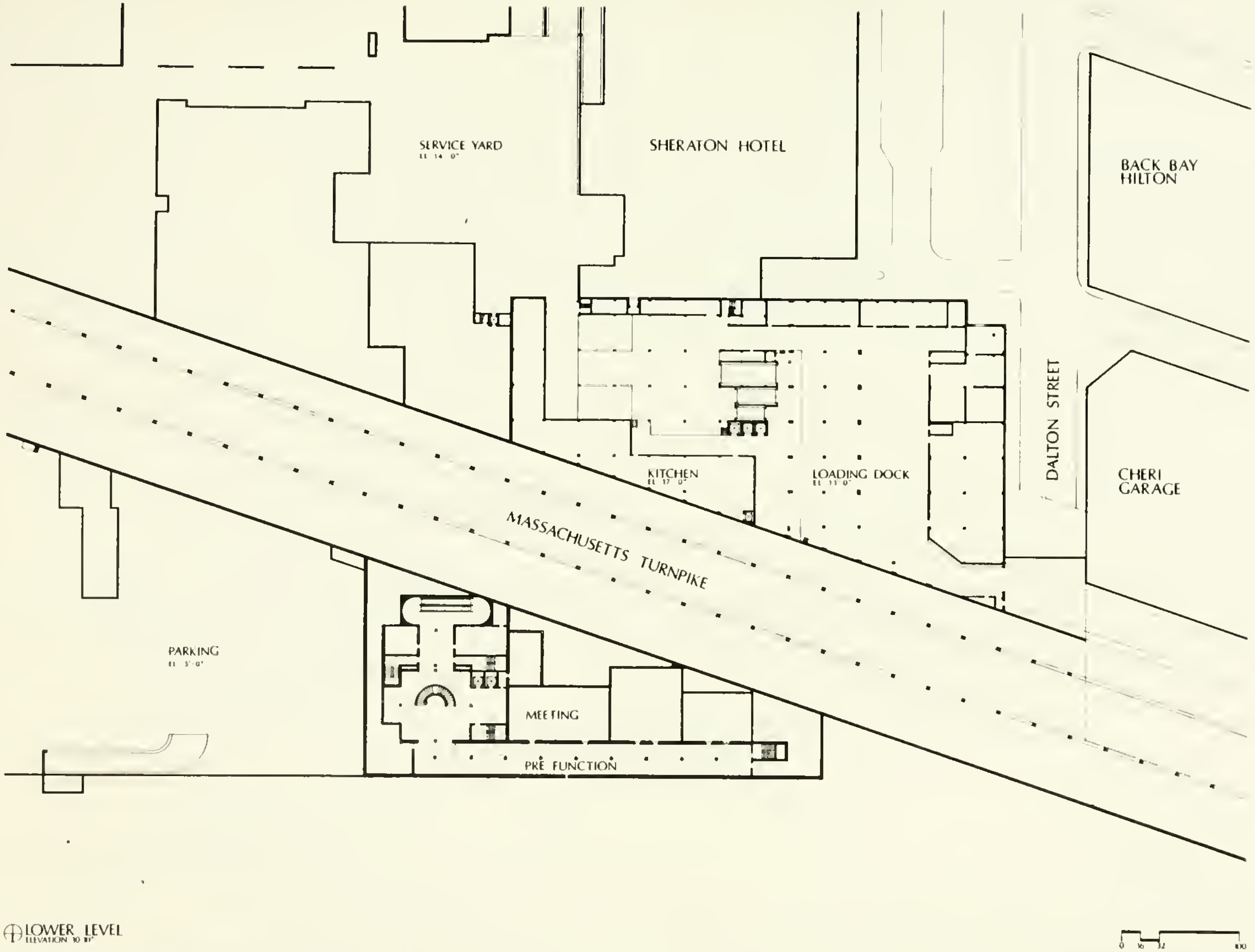
The flow of goods will be facilitated by changes proposed in the basement. A new loading area for building services will be created, thus freeing up space for two additional loading docks providing a total of 49,000 sq. ft. for movement of exhibit materials. Additional elevator service will be provided and truck access will be improved from Huntington Avenue by widening the egress drive.



HYNES AUDITORIUM EXPANSION

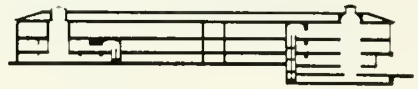
CITY OF BOSTON KEVIN H WHITE MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J RYAN, DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B MANSON, DIRECTOR
OCTOBER, 1982

ARCHITECTS KALLMANN McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC



LEGEND

MEETING	10,700 sf
PRE FUNCTION/CIRCULATION	16,900 sf
SUPPORT	102,600 sf
TOTAL	130,200 sf



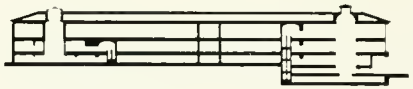
KEY SECTION

HYNES AUDITORIUM EXPANSION

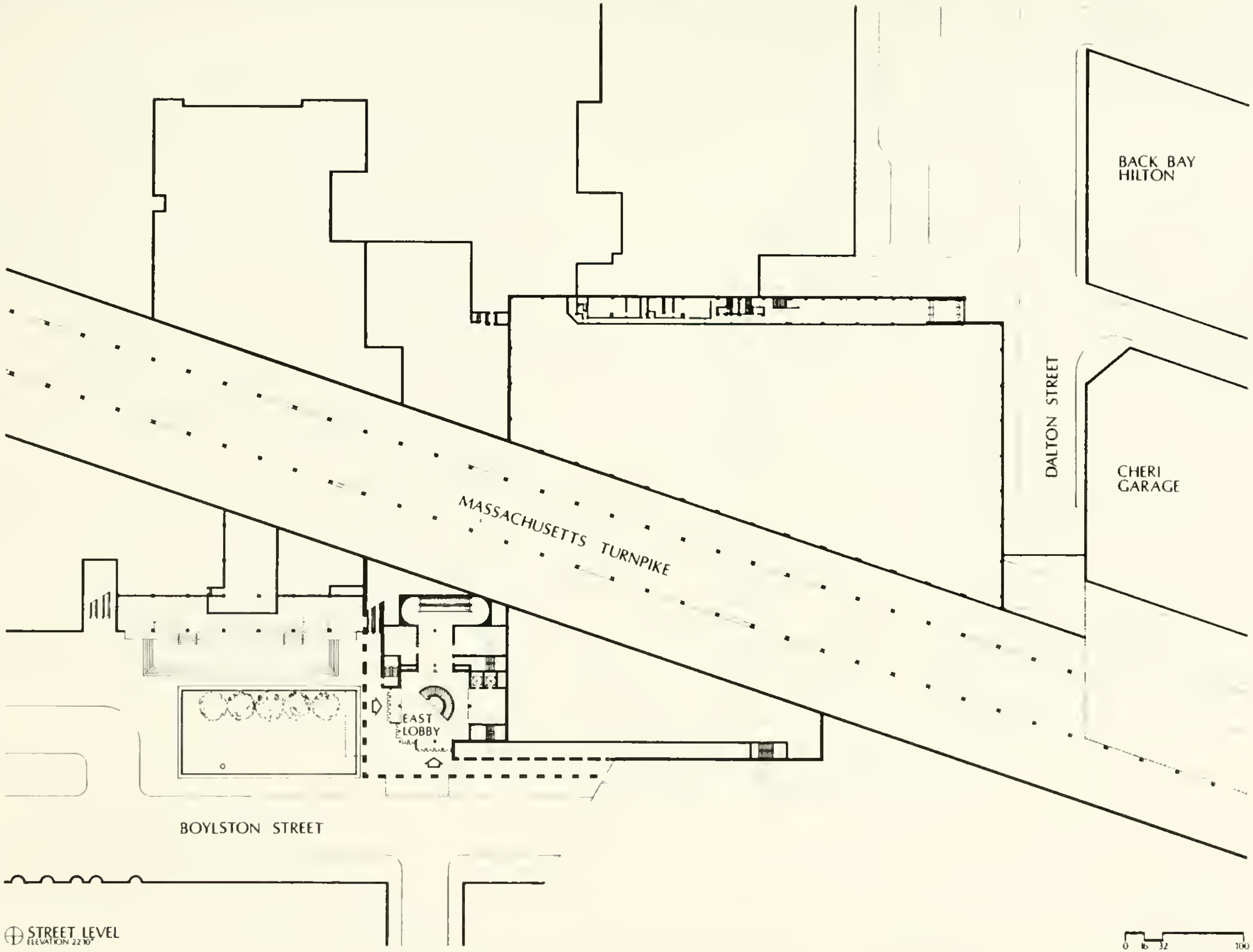
CITY OF BOSTON KEVIN H. WHITE, MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J. RYAN, DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B. MANSON, DIRECTOR
OCTOBER, 1982

ARCHITECTS KALLMANN McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC

LEGEND	
PRE FUNCTION/CIRCULATION	7,500 sf
SUPPORT	14 200 sf
TOTAL	21,700 sf



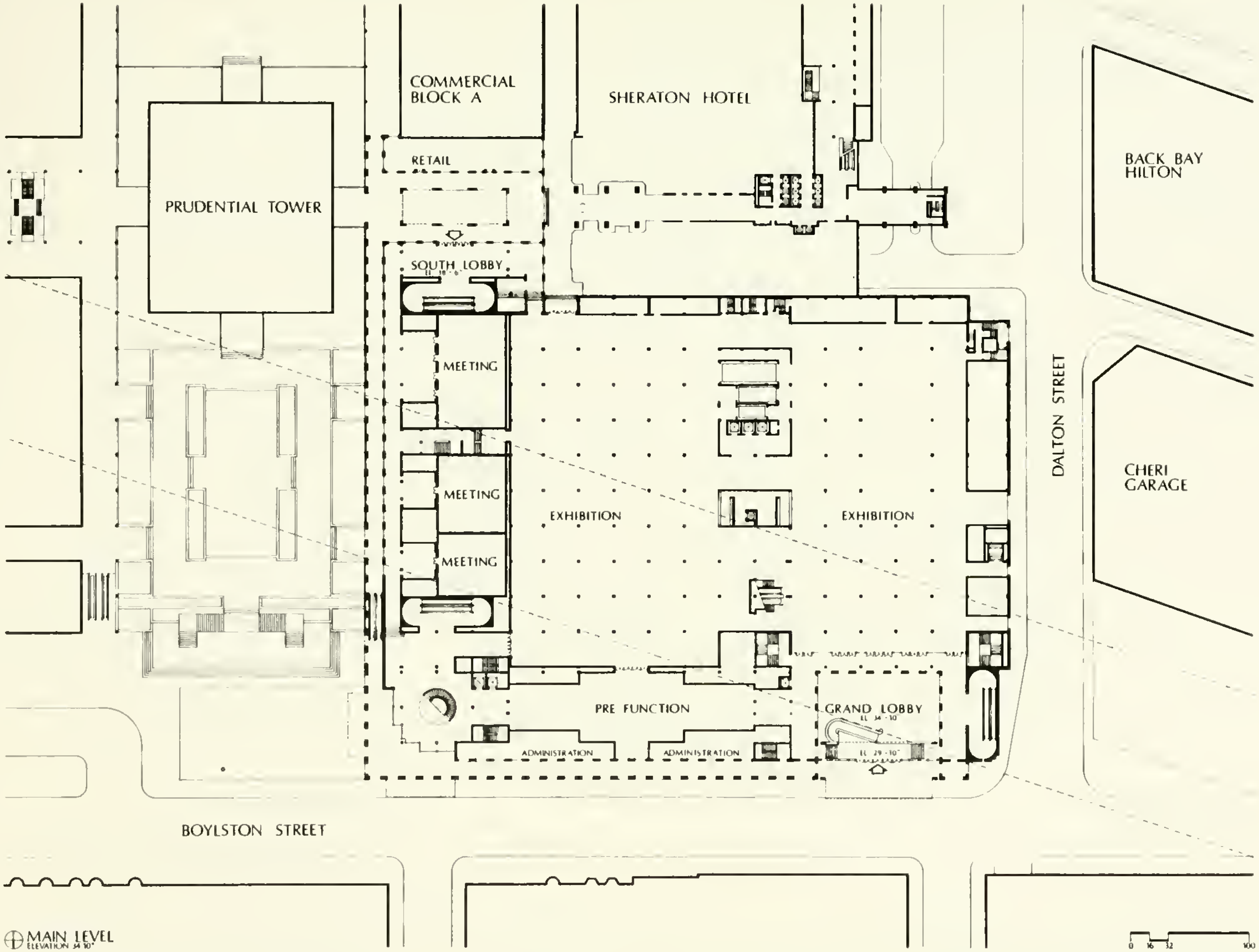
KEY SECTION



H Y N E S A U D I T O R I U M E X P A N S I O N

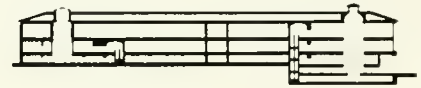
CITY OF BOSTON KEVIN H WHITE, MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J. RYAN, DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B. MANSON, DIRECTOR
OCTOBER, 1982

ARCHITECTS KALLMANN McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC



LEGEND

	MEETING	12,600 sf
	EXHIBITION	105,000 sf
	PRE FUNCTION/CIRCULATION	54,400 sf
	SUPPORT	40,900 sf
	TOTAL	212,900 sf

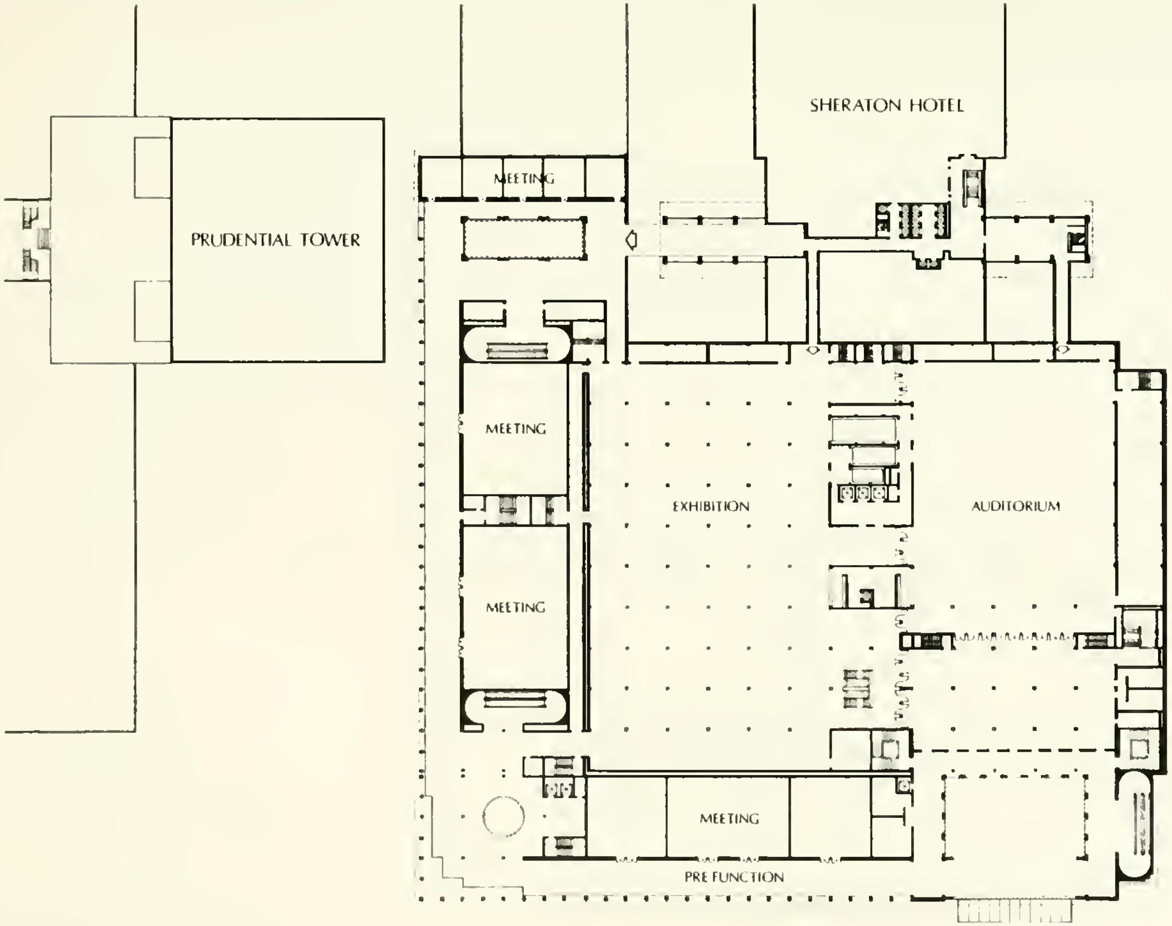


KEY SECTION

HYNES AUDITORIUM EXPANSION

CITY OF BOSTON KEVIN H. WHITE MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J. RYAN DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B. MANSON DIRECTOR
OCTOBER, 1982

ARCHITECTS KALLMANN McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC.



LEGEND

MEETING	34,900 sf
EXHIBITION	105,000 sf
PRE FUNCTION/CIRCULATION	50,700 sf
SUPPORT	36,600 sf
TOTAL	227,200 sf

KEY SECTION

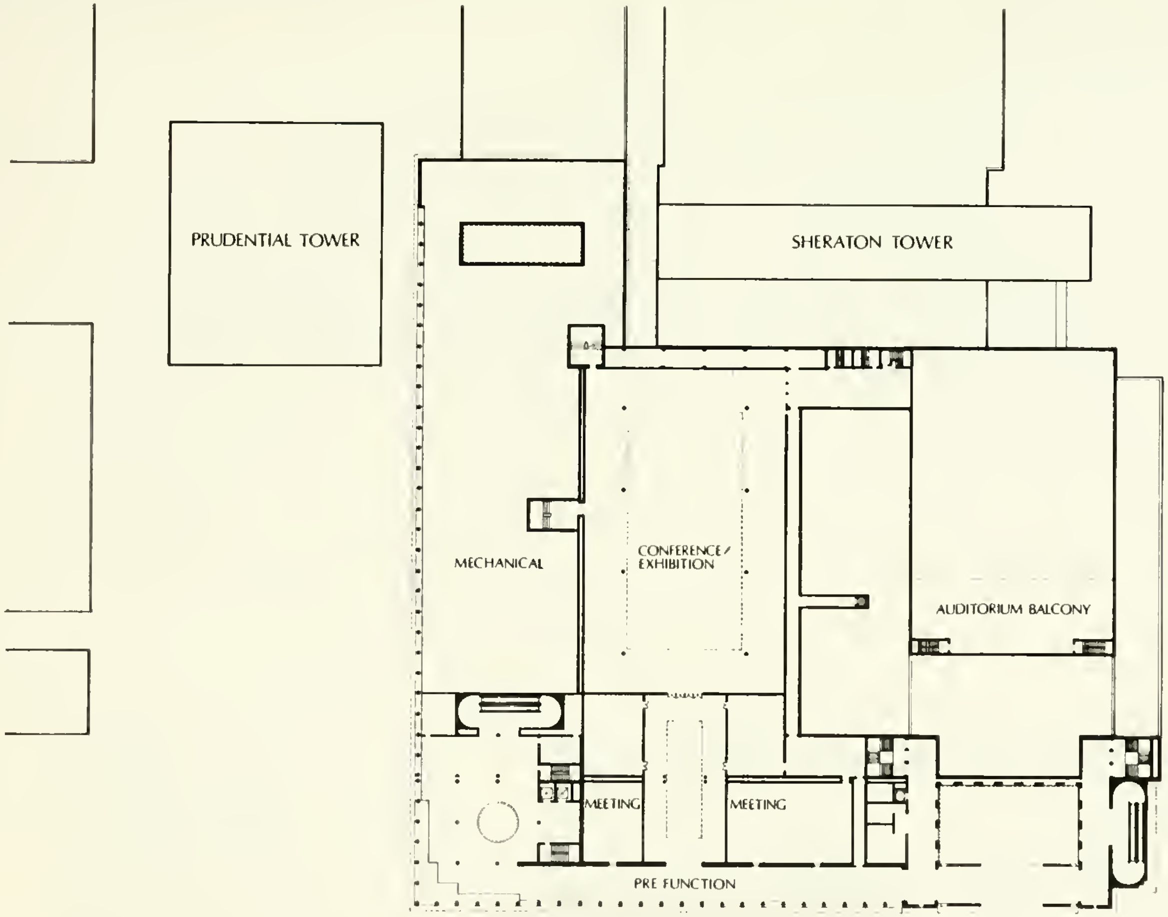
SECOND LEVEL
ELEVATION 54'10"

0 16 32 100

HYNES AUDITORIUM EXPANSION

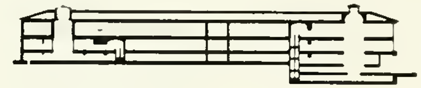
CITY OF BOSTON KEVIN H WHITE, MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J RYAN, DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B MANSON DIRECTOR
OCTOBER, 1982

ARCHITECTS KALLMANN McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC



LEGEND

	MEETING	13,700 sf
	CONFERENCE/EXHIBITION	36,000 sf
	PRE FUNCTION/CIRCULATION	38,900 sf
	SUPPORT	20,900 sf
	TOTAL	109,500 sf



KEY SECTION

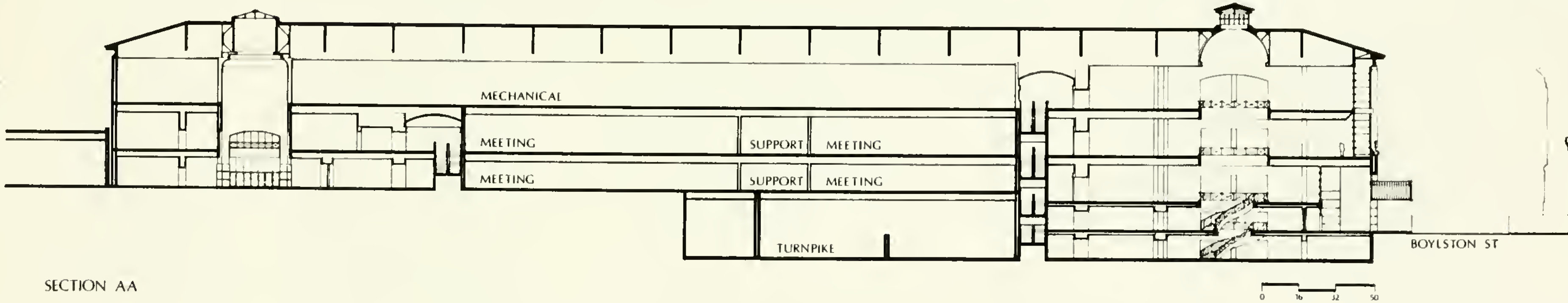
THIRD LEVEL
ELEVATION 74'10"

0 16 32 100

HYNES AUDITORIUM EXPANSION

CITY OF BOSTON KEVIN H. WHITE MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J. RYAN DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B. MANSON DIRECTOR
OCTOBER, 1982

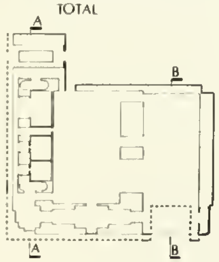
ARCHITECTS KALLMANN McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC

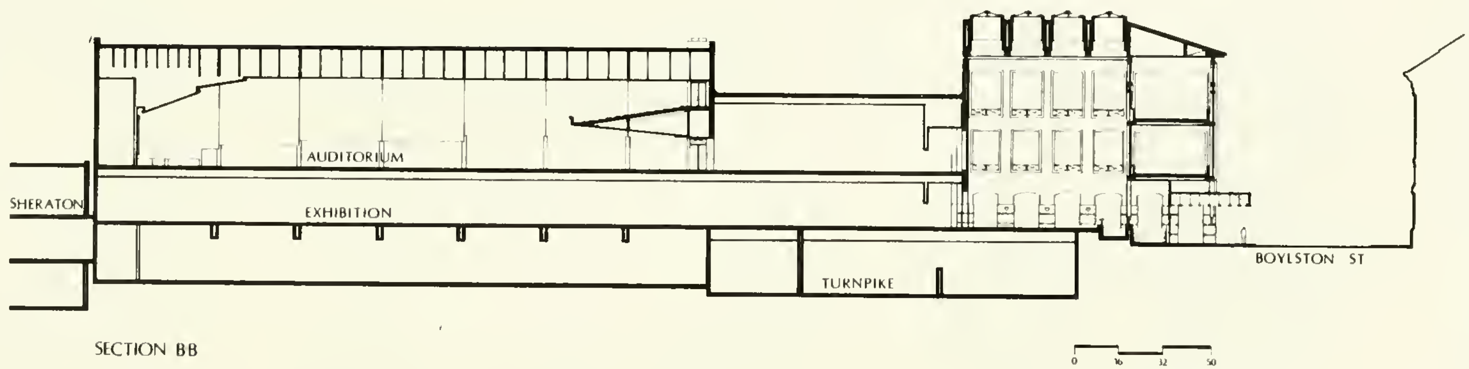


SECTION AA

LEGEND

	MEETING	71,900 s.f.
	EXHIBITION	210,000 s.f.
	CONFERENCE/EXHIBITION	36,000 s.f.
	PRE FUNCTION/CIRCULATION	168,400 s.f.
	SUPPORT	215,200 s.f.
	TOTAL	701,500 s.f.





SECTION BB

HYNES AUDITORIUM EXPANSION

CITY OF BOSTON KEVIN H. WHITE, MAYOR
BOSTON REDEVELOPMENT AUTHORITY ROBERT J. RYAN, DIRECTOR
DEPARTMENT OF PUBLIC FACILITIES DONALD B. MANSON, DIRECTOR
OCTOBER, 1982

ARCHITECTS KALLMANN, McKINNELL AND WOOD
STRUCTURAL ENGINEERS WEIDLINGER ASSOCIATES
MECHANICAL ENGINEERS TMP CONSULTING, INC.

D. PHASING

Construction of the proposed expansion will consist of three phases, each phase requriing approximately one year for its completion. The proposed phasing process will allow for the present facility to remain operational throughout construction with additional increments of Exhibit and Meeting Space being added to the existing facility at the completion of each of the three phases.

The construction schedule, summarized below, identifies the amount of Exhibit and Meeting Space available for rental purposes for each construction phase. Note that the dates provided are based on the award of Design Contracts no later than January 1983.

CONSTRUCTION PHASING

YEAR	CONSTRUCTION PHASE	SPACE AVAILABLE AT HYNES
Jan. - Dec. 1984	Phase I	12,000 sq. ft. of Meeting 140,000 sq. ft. of Exhibit
Jan. - Dec. 1985	Phase II	22,300 sq. ft. of Meeting 99,600 sq. ft. of Exhibit
Jan. - Dec. 1986	Phase III	22,300 sq. ft. of Meeting 156,000 sq. ft. of Exhibit
January 1987	Completion	71,900 sq. ft. of Meeting 36,000 sq. ft. of Conference/ Exhibit 210,000 sq. ft. of Exhibit

Phase 1:

Consisting of some 157,000 sq. ft. of construction, this phase encompasses the area, not yet built upon, in front of Commercial Block "C", Commercial Block "C" itself, and the West Court area. Upon its completion, the major elements added to the existing facility will be a new Lobby at plaza level with access from Boylston and Huntington Avenue provided at either end and on the second level additional Meeting Space with direct access to the Sheraton Hotel.

Phase 2:

The filling in of the Auditorium at the second level with new floor area and the construction of the Grand Lobby will require the shutting down of this portion of the existing facility. With its completion an additional 72,000 sq. ft. and a third point of entry will have been added to the Hynes.

D. PHASING

Phase 3:

The third phase will involve building a new third floor Conference/ Exhibit Space and completing construction in the Ring Road area. This phase will overlap with and extend beyond the completion of Phase 2 by some 11 months. A total of 146,000 sq. ft. will be added in this phase.

Construction Manager:

If the decision is made to phase the project as outlined above, serious consideration should be given to utilizing a Construction Manager throughout the process. Some of the consideration that would affect the process include:

- Construction could start considerably earlier than would be the case if a single construction contract with three phases were to be publicly bid.

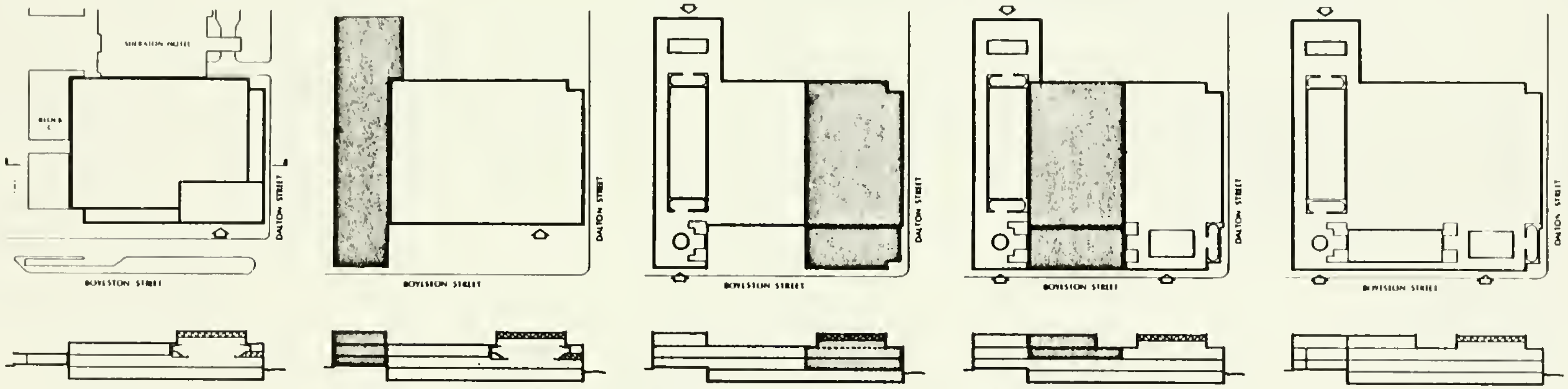
- This project will require an extraordinary amount of coordination and scheduling, including relocation of existing businesses, demolition and maintaining both public access through the site and operational usage of Hynes itself. Some of these activities should be done before the general construction commences.

- Our best estimate is that Construction Management could add about 5% to the cost of construction; however, if it allows the process to start, say 6 months earlier, there could accrue savings from the escalation that would be eliminated. The longer the start of final design is delayed, the more important this factor becomes, both in construction cost and for the completion date of the finished Hynes.

- The use of a Construction Manager, and the probable bidding of a number of construction contracts, will have to be evaluated within the framework of the laws that govern this project.

PHASING OF OPERATIONS AND CONSTRUCTION

EXISTING — PHASE ONE — PHASE TWO — PHASE THREE — COMPLETED



EXISTING

NET AVAILABLE AREAS

MEETING	12,000 s.f.
EXHIBITION	141,600 s.f.

PHASE ONE

OPERATIONS AND CONSTRUCTION

EXISTING FACILITY REMAINS OPERATIONAL

EASTERN ENTRANCES AND MEETING ROOM ADDITION ARE UNDER CONSTRUCTION

NET AVAILABLE AREAS

MEETING	12,000 s.f.
EXHIBITION	141,600 s.f.

PHASE TWO

OPERATIONS AND CONSTRUCTION

NEW ENTRANCES ARE OPENED AND EASTERN ADDITION BECOMES OPERATIONAL

AUDITORIUM IS RELOCATED TO SECOND LEVEL AND GRAND LOBBY ADDITION IS UNDER CONSTRUCTION.

NET AVAILABLE AREAS

MEETING	22,300 s.f.
EXHIBITION	99,600 s.f.

PHASE THREE

OPERATIONS AND CONSTRUCTION

GRAND LOBBY, NEW AUDITORIUM AND RENOVATED EXHIBITION HALL BECOME OPERATIONAL

BOYLSTON STREET MEETING ROOM ADDITION AND CONFERENCE/EXHIBITION SPACE ARE UNDER CONSTRUCTION

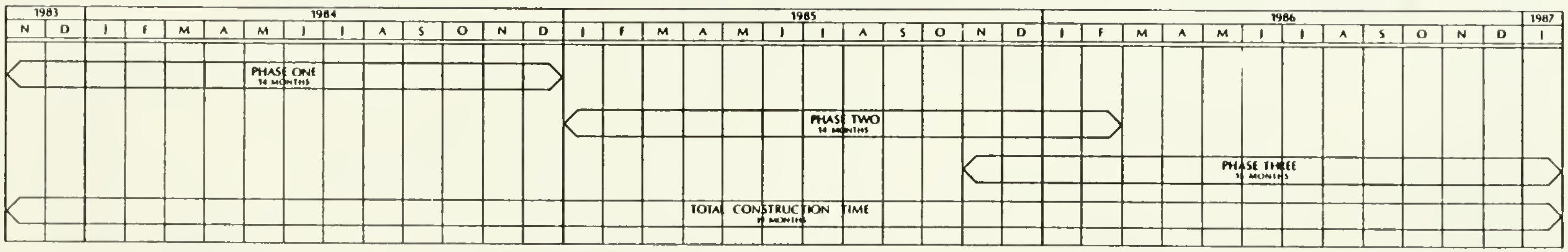
NET AVAILABLE AREAS

MEETING	22,300 s.f.
EXHIBITION	156,000 s.f.

COMPLETED

NET AVAILABLE AREAS

MEETING	71,900 s.f.
EXHIBITION	210,000 s.f.
CONFERENCE/EXHIBITION	36,000 s.f.



Code / Fire Protection

1. Existing Conditions & Development

Firepro Inc.

INDEX

FIREPRO File: 6K1202 December 28, 1982

SUMMARY

The consulting engineer has provided input concerning Code requirements for a wide range of fire protection features of the building and has provided detailed analysis of the means of egress requirements for the building. That analysis has resulted in an arrangement of the fire protection features including the means of egress system in a manner compatible with the phased construction of the project and final arrangement of the facility upon completion of the project.

PHASE I - FINAL REPORT

FIREPRO Incorporated has been retained to provide building code and fire protection engineering consulting services to the Hynes Auditorium Expansion Design Team. This effort has included a limited review of existing conditions in the building, primarily those related to the means of egress system, a review of the initial three options (Options I, II, III) for the proposed expansion and the Option IV A Program. Basic building code requirements and recommendations concerning fire protection features for the Option IV A program have been developed.

Existing Conditions Survey

FIREPRO Incorporated has not conducted an on-site inspection of existing arrangements of most fire protection features of the Hynes Auditorium. The mechanical and electrical engineering consultants have surveyed and reported upon the existing standpipe, automatic sprinkler and fire alarm systems.

FIREPRO Incorporated has performed a limited study of the existing means of egress system for the Hynes Auditorium. The analysis of population projections and available exit capacity indicates there is presently insufficient exit capacity available for the populations anticipated on both the first and second floors. In addition, the large concentration of exit capacity at the main entrance/exit at Boylston and Dalton Streets with smaller exits at other locations does not balance well with the general distribution of persons in the facility.

Other basic features of the existing means of egress system including number of exits, travel distance, etc., do satisfy current Code criteria.

Proposed Expansion

The proposed expansion of the Hynes Auditorium requires that the existing building as well as the new addition be constructed to meet the requirements of the 4th Edition of the Massachusetts State Building Code.

The primary impact of the proposed expansion is related to the means of egress system. The large potential population of the facility, especially on levels above grade, requires that the capacity of the means of egress system must also be large. As a result, multiple wide stairs and large numbers of doors to the outside must be provided. Horizontal exits will be needed to provide sufficient exit capacity on the second and third levels.

Security arrangements which call for exhibit areas to be locked will require that the means of egress system function without access through exhibition spaces. This must be achieved by suitable arrangement of the lobby and prefunction areas and location of the exits that serve lobby and prefunction areas.

The provision of large meeting rooms which may be subdivided into multiple smaller meeting rooms will require that exits of such areas be arranged carefully to meet code criteria for numbers of exits from rooms with large populations.

The proposed expansion program includes creation of new spaces or expansion of existing spaces which will allow open vertical communication of multiple floors. Specifically, the Grand Lobby will be arranged as a three story space, the East Lobby will have an open well connecting five stories and a nearby open escalator connecting those same five stories, and the South Lobby will have an open escalator connecting two stories. In addition, an existing open escalator between the Main Level and Level 2 will be retained.

These spaces must be arranged in accordance with Building Code requirements for open wells treated as atriums or floor openings for stairs which are not required exits. Those Code requirements include building features which have some impact on architectural, mechanical and electrical features of the building.

Requirements for other fire protection features of the Hynes Auditorium including fire alarm system, standpipe system and automatic sprinkler systems will originate in the Massachusetts State Building Code and other standards of good practice in the fire protection field. The details of such systems are relatively well defined and are relatively independent of the details of the expansion program.

Options/Choices/Recommendations

Concepts of the fire defense features for the expanded facility are presented more completely in the Volume II Report. Several specific options concerning specific features are discussed below.

Means of Egress

The need for a large capacity exit system has the greatest impact on the design of the Hynes Auditorium Expansion. The principal options available for arrangement of exits of the means of egress to satisfy exit capacity requirements are (1) provision of adequate capacity using exit stairs and horizontal exits into adjacent buildings or (2) provision of a combination of exit stairs, horizontal exits into adjacent buildings and internal horizontal exits.

If the required exit capacity were provided using exit stairs and horizontal exits into an adjacent building (the Sheraton Boston Hotel), the total width of stairs required would be large. Inclusion of additional stairs at this time would cause loss of large areas of other use spaces on the floor from which the stair was to discharge to the outside and all floors which it would serve.

The Option IV A program includes the area required for some stairway exits on the main and second levels. Slightly less than this area is devoted to stairs on the third level. If sufficient exit capacity were provided to serve the individual floor populations with exit stairs only, a large amount of additional floor area would be required on these levels.

A relatively small percentage of the overall required exit capacity may be provided by horizontal exits into the adjacent Sheraton Boston Hotel pending an agreement with the hotel and assuming security arrangements do not prevent such use.

If the second and third levels are subdivided by two hour fire rated fire separation walls, it is possible to utilize the horizontal exit concept for evacuation of those levels on a fire area basis rather than total floor area basis. The logical subdivision of the second floor to create horizontal exits is along the north/south line between the Auditorium to the west and the exhibition space to the east. The subdivision of the third floor by a two hour fire rated fire separation partition appears to be best arranged along the walls separating the conference/exhibition space from the prefunction and meeting room area.

When such horizontal exits are created, requirements for exit stairs are significantly reduced. On the basis of approximate population projections and a suitable array of horizontal exits and stairway exits, the means of egress system can be made to meet the requirements of the Massachusetts State Building Code for exit capacity.

It is necessary for the technically correct arrangement of the horizontal exit concept discussed above to eliminate the escalator between the exhibition spaces of the Main and Second Levels or to otherwise provide a fire/smoke stop barrier to isolate that floor opening from the west third of the Main Level (Grand Lobby, Exhibition).

The escalator opening may be isolated by

(1) Providing a two hour fire rated fire separation partition on the Main Level along the north/south line between the Grand Lobby/west exhibition area and the east exhibition area,

(2) Providing a two hour fire rated fire separation partition around the Main Level escalator itself,

(3) Providing fire rated shutters which will close the opening upon alarm of the fire alarm system, or

(4) Eliminating the escalator completely and filling the floor opening with fire rated floor construction.

These four options are illustrated conceptually in Figure No. A-1.

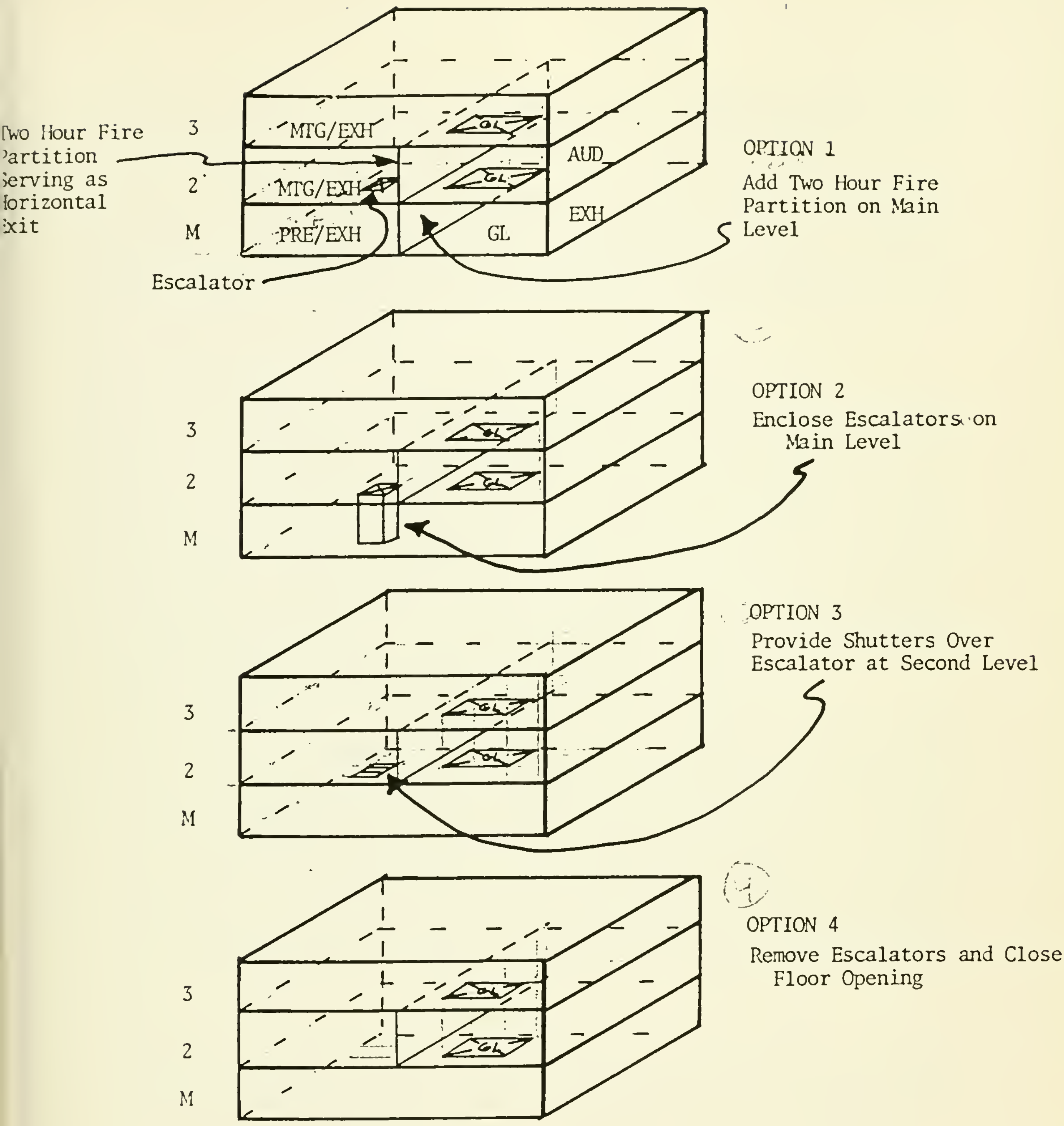
Option 2 involving a fire rated enclosure surrounding the escalator on the Main Level has been selected for two reasons. First, this permits the escalator to be retained for use in connection with the exhibit spaces. Second, it permits the main level east and west exhibition spaces to remain relatively open to each other.

Vertical Openings

The vertical openings in the Grand Lobby and East Lobby must be treated in accordance with requirements for atriums in the Massachusetts State Building Code. The principal option to be considered in arrangement of these spaces is the trade-off between the degree of separation of these spaces from adjacent spaces and the requirement for mechanical exhaust of these spaces. Specifically, in one option, these spaces may be left open to the adjacent prefunction, meeting, exhibition or auditorium spaces. In such a case, the Building Code requirement for exhaust of atriums requires that the entire volume of the building which is open to the atrium be used as the basis of calculation for exhaust capacity to be provided at the top of the atrium.

In the second option for treatment of the atrium spaces, partitions having either a one hour fire rating or of noncombustible construction including glass with close spaced sprinklers adjacent to the partition may be provided to separate prefunction, meeting, exhibition and auditorium spaces from the lobby spaces. In this situation, the volume which is the basis for exhaust capacity from the top of the atrium is reduced to that volume inside this atrium perimeter partition.

The presence of a physical barrier (the perimeter partition) should result in more effective limitation of smoke spread during a fire incident than an arrangement without a perimeter partition. The provision of the perimeter partition will also significantly reduce the sizes of the required exhaust systems.



Notes: AUD = Auditorium
GL = Grand Lobby
PRE = Prefunction
EXH = Exhibition Space
MTG = Meeting Rooms

NES DITORIUM	CONCEPTS FOR ISOLATION OF ESCALATOR	file 6K1292 / drawn LAH	date 12/29/82 / chk'd HRC	FIG. A-1

REPRO Incorporated

Postal Box 145 Telephone (617) 237-1153
Wellesley Hills, Massachusetts 02181

Thus, the second option arrangement of a one hour fire rated partition or a smoke stop partition surrounding the atrium has been selected as part of Option IV A.

The South Lobby escalator is required to be treated by specific rules of the Building Code concerning escalators. No options exist with respect to arrangement of the South Lobby. However, isolation of the South Lobby by perimeter partitions for the reasons discussed above concerning the Grand Lobby and East Lobby will be considered.

Fire Alarm System

The Massachusetts State Building Code and other current standards of good practice do not require fire alarm systems to sound within large population spaces such as the Auditorium and the Conference/Exhibition Room. This position has been taken in these and earlier standards on the basis that sounding an alarm in such a space may cause "panic" which leads to personal injuries even when a fire situation or false alarm condition does not significantly threaten the occupants of a space. However, limited studies of people's reaction in such situations indicate panic may be an exception rather than the rule. In addition, the technology of fire alarm systems has evolved to the point where automatic voice announcements may be effectively utilized to give specific instructions to building occupants.

On the basis of these considerations, it is proposed to arrange the fire alarm system for the Auditorium, Conference/Exhibit Room and larger meeting rooms to cause visual fire alarm signals to be activated within those spaces and to cause automatic voice announcements of an evacuation request to take place. In addition, in rooms where subdued lighting may be used such as during stage performances or slide shows, lighting controls will be arranged to restore lighting to full brightness upon alarm of the fire alarm system. This action should draw room occupants' attention from the performance or other activity to the need for orderly evacuation of the space following voice announcements.

Phasing

The phased construction of the Expansion Project will increase the possibility of a fire occurring in the facility and may have a negative impact upon the means of egress system for portions of the facility which remain in use during the construction.

Zoning of fire alarm, standpipe and automatic sprinkler systems will be arranged to permit installation of new equipment and modification of existing equipment on a phase by phase basis. This will permit these fire protection features to be placed in service as the individual phases of work are complete.

Specific arrangement of the means of egress system during the distinct phases of construction must be examined at a time when physical and operational considerations are well defined.

Soils

1. Existing Conditions & Development

Haley & Aldrich, Inc.

INDEX

SUMMARY

Based on a review of the proposed expansion (as shown on Figure 1) with regard to the existing structures and soil conditions (refer to Figure 2) at the subject site, it is our preliminary opinion that:

- the additional building loads in AREAS A-1, 2, E-1, 2, 5 may be added to the existing piles such that the stresses are increased by 15 to 20 percent. Therefore, to add new piles in these areas may not be necessary.

- the approximate average loading of 500 to 1,000 lbs/s.f. will be maintained on the mat foundation in AREA E-4 during the expansion through the exchange of building loads. Therefore, the existing foundations may remain intact.

- the proposed addition in AREA E-3 can be supported on a new mat foundation provided that the underlying organic soils are excavated and replaced with engineered compacted fill. Alternatively, pressure injected footings may be used to support the intended loads.

Pending additional review and analyses with regard to the existing soil conditions and existing foundation design, it is our preliminary opinion that the proposed expansion is technically feasible.

I. EXISTING CONDITIONS AND DEVELOPMENT

A. SUMMARY OF EXISTING CONDITIONS

1. Subsurface Soil and Groundwater Conditions

The following sources of information were researched to obtain data regarding subsurface soil and groundwater conditions in the vicinity of the subject site:

- Haley & Aldrich, Inc. files.
- Boring Data from Greater Boston contained in the Boston Society of Civil Engineers' Journals.
- Massachusetts Bay Transit Authority Drawings of the Boylston Street Subway.
- Report entitled "Foundation Investigation for Prudential Center in Boston, Volume I and II", dated March 1958, by Leo and Arthur Casagrande.

Based on our review of the subsurface information collected to date, it is anticipated that the subsurface soil and rock conditions consist of the following:

Soil Strata	Range of Thickness
Fill	20-30 ft.
Organic Silt and Peat	2-8 ft.
Sand	7-24 ft. (average 15-20 ft.)
Clay	110-150 ft.
Glacial Till	0-7 ft.
Bedrock	At or below El. -125

It should be noted, however, that the soil data in this specific area are limited and can be considered typical only. An approximate soil profile is illustrated on Figure 2.

Groundwater levels in the vicinity are anticipated to be between El. 7 and El. 9 (Boston City Base).

2. Existing Foundations

In order to determine the types of existing foundations in the area of the proposed renovation, the following drawings were reviewed:

- "Foundation & Pile Plan of Municipal Auditorium, Boston, Massachusetts" Drawing No. F1, dated 8 January 1962, prepared by Hoyle, Doran & Berry, Architects.

- Drawing Nos. S-2.8, S-2.9 and S-2.12 for the Prudential Center, prepared by Charles Luckman Associates, dated 1 July 1981, entitled respectively:

  "Foundation - Plan Area G"
  "Foundation - Plan Area H"
  "Foundation - Plan Area K"

- As-built drawings prepared by the Massachusetts Turnpike Authority for the Boston Extension of the Massachusetts Turnpike from Station 542+00 to 555+00. (Drawing Nos. HC5-2, 4, 5, 8, 9, 10, 13, undated.)

- Drawing prepared by Metcalf & Eddy, Inc. entitled "Prudential Center, Figure 3, Foundation Plan", dated May 1970.

These drawings indicate the following types of existing foundations in the area of the proposed renovations (refer to Figure 1 for indicated AREAS):

- AREAS A-1 and E-1: Under the Hynes Auditorium, south of and including column line HD, concrete-filled steel pipe piles (16 in. dia. by 3/8 in. wall) were installed to end-bearing in the underlying glacial till or rock strata. Typical pile lengths are 140 to 180 ft. The design capacity indicated on the drawings is 120 tons per pile.

- AREA A-2 and E-2: Under the Hynes Auditorium and in the Turnpike right-of-way north of column line HD, steel H-piles (14 BP 117 lb. section) were driven to end-bearing in the underlying glacial till or rock strata. Typical pile lengths are 155 to 180 ft. The indicated design capacity is 120 tons per pile.

- AREA E-3: In this area there is no existing structure. The sidewalk and Ring Road are supported on earth fill.

- AREA E-4: In these two areas the building loads are supported on mat foundations. No design bearing pressure was indicated on the drawings. However, based on the existing column loads calculated by the structural engineer the apparent bearing pressures below the mat foundations range between 500 to 1000 lbs/s.f. The mat thicknesses are shown to be 2'-11" and 2'-3" north and south of Turnpike right-of-way, respectively.

- AREA E-5: In the Turnpike right-of-way to the east of the Auditorium, concrete-filled thin shell piles (12 in. dia. Cobi piles) were installed to end-bearing in the upper sand stratum. Typical pile lengths may be about 15 ft. No design capacity was indicated on the drawings; however, based on the 1964 edition of the City of Boston Building Code the maximum allowable capacity of these piles was 51 tons each.

The present condition of the pile foundations under the existing Hynes Auditorium and in the area of the proposed expansion is unknown at this time. The organic soils underlying the subject site and stray electrical currents from the adjacent subway tunnel under Boylston Street can have a deleterious effect on the structural capacity of steel piles unless they are properly protected from corrosion.

To protect the piles in Areas A-1, A-2, E-1 & E-2 from possible corrosion, a detail on Drawing No. F1 of the Hynes Auditorium structural drawings indicates that a cathodic protection system was installed. To date, however, it has not been determined if this system is still in service or even if it was installed during construction.

The corrosive environment of the site does not readily affect the Cobi piles (AREA E-5) since their structural capacity does not rely on the outer steel shell, but only on the concrete fill.

B. PROPOSED EXPANSION

The proposed expansion, the limits of which are shown on Figure 1, is understood to consist of the following:

- Renovation of the existing Hynes Auditorium (AREA A-1) to make more efficient use of the space. In addition, a new meeting room will be constructed on the roof of the existing second floor exhibit hall.

- A three story addition to the existing auditorium will be constructed in AREAS E-1 through E-5 with one basement level below grade in AREA E-3, where no structure currently exists. (The existing structures in AREA E-4, south of the Turnpike, and E-5 will be razed to the plaza level of the existing Prudential Center to make room for the addition).

As noted above, the major portion of the footprint of the proposed expansion area will occupy areas of existing pile or mat foundations. Only Area E-3 has no present foundation.

The installation of new or supplementary foundation support systems below existing structures would be technically difficult and costly. This would be compounded by the fact that the Hynes must remain in operation during the construction period. Therefore, strong consideration must be given to developing a solution whereby the existing foundations are utilized to the extent possible.

C. OPTIONS AND RECOMMENDATIONS

1. Tentative Criteria for Foundation Support

Estimates of existing and future structural loadings at foundation level (dead load + live load) were provided by Weidlinger Associates for the area of the proposed expansion. (Re. Drawing No. SL-1, dated 18 November 1982).

In our opinion, consideration should be given the following:

- AREAS A-1 and E-1: As previously indicated, this portion of the Hynes Auditorium is supported on 120-ton capacity 16-in. diameter pipe piles end-bearing in the underlying glacial till or rock stratum. However, subsequent to the construction of the Auditorium in 1965, the Commonwealth of Massachusetts State Building Code has gone through several revisions with regard to allowable stresses in piles. The most recent edition (Third Edition - 1979) allows a net static loading of 155 tons on these piles, which is an increase of 29 percent in the allowable load.

  It is tentatively recommended that additional loads may be added to these piles such that the stresses are increased by 15 to 20 percent. Even though allowable static design stresses in the pile section may have been increased, the actual driving conditions and criteria must be reviewed. Further investigations are required, as discussed below.

- AREAS A-2 and E-2: The foundations in this area consist of 120-ton capacity 14 BP 117 H-piles, also driven to end-bearing in the underlying glacial till or rock stratum. The current edition of the Code allows a net loading of 147 tons on these piles (an increase of 23 percent in the allowable capacity over the apparent original design). Again, as for Area I, the tentatively recommended load increase on these piles should be limited to 15 to 20 percent, subject to additional analyses and investigations.

- AREA E-3: No building currently exists in this area. The proposed expansion scheme indicates that a three story addition with one basement level below grade is planned as shown on Figure 1.

  - Based on the geometry of the proposed addition and the structural loadings as we currently understand them, it is our preliminary opinion that it may be technically feasible to support the structure on a mat foundation bearing on compacted structural fill. In this scheme, the fill materials and organic soils underlying the bearing level of the mat foundation would be excavated down to the top of the sand stratum. The excavation would then be backfilled with select compacted granular fill to the bearing level of the mat. Additional analyses will have to be made, however, to predict settlements of the structure before this scheme can be recommended.

  - Alternately, pressure injected footings may be installed to bear in the underlying sand layer. With this alternative, over-excavation of the fill and organic soils would not be necessary.

  Based on the depth and configuration of the proposed addition in this area, as is currently understood, it is believed that only minor construction dewatering will be required for either of the proposed foundation schemes. To minimize the amount of construction dewatering for the "excavate and replace" scheme, the proposed excavation will have to be supported by a continuous sheet pile wall which extends down at least 5 ft. into the underlying clay stratum.

  Pending additional engineering analyses with regard to foundation design, an underslab drainage system for permanent control of possible hydrostatic uplift pressures may be required.

- AREA E-4: The building loads in this area are supported on a mat foundation bearing on the underlying upper sand stratum (see Fig. 2 for typical soil profile). The design contact pressure below the mats is not known at this time. However, it is understood from the structural engineer that the exchange of column loads between existing and future conditions is such that the present approximate average loading of 500 to 1,000 lbs/s.f. will be maintained. Our preliminary analyses indicates that this loading appears to be feasible. However, additional investigations and analyses will have to be performed to assess the effect of the changing loads on the settlement of the foundation.

- AREA E-5: The design capacity of these piles, as installed during the original construction, is not known at this time. However, the current Building Code allows a 47 percent increase in the allowable concrete stress as compared to the 1964 edition. Again, until further investigations and analyses can be made, it is tentatively recommended that the load increase on these piles be limited to 15 to 20 percent.

2. Recommended Additional Investigations

In order to provide information to develop final design, the following additional investigations are recommended:

1. If possible, the installation records of the piles installed in Areas A-1,2, E-1,2,5 should be obtained and reviewed by us in order to confirm that the piles were driven with enough energy and to the required depth to achieve the indicated design capacities. Additional analyses must be performed with regard to allowable load increases on the piles. If the installation records cannot be obtained, or if the data are inconclusive, one or more field load tests may have to be performed to demonstrate the allowable capacities of the piles.

2. With regard to the piles in Areas A-1, 2 and E-1, 2, it should be determined as to whether the cathodic protection assumed to be installed is still functioning or whether some other type of corrosion protection was applied to the piles. In addition, it is further recommended that several test pits be excavated in order that the condition of the piles be observed to determine the extent of any possible corrosion.

3. To better assess the requirements for new foundations in Area E-3 it is recommended that at least three borings be made in the area of the Ring Road. The borings should be deep borings drilled into the underlying rock stratum. Undisturbed samples of the clay stratum should be taken for testing in order that settlement analyses can be made with regard to the new and increased loading on the proposed and existing foundations.

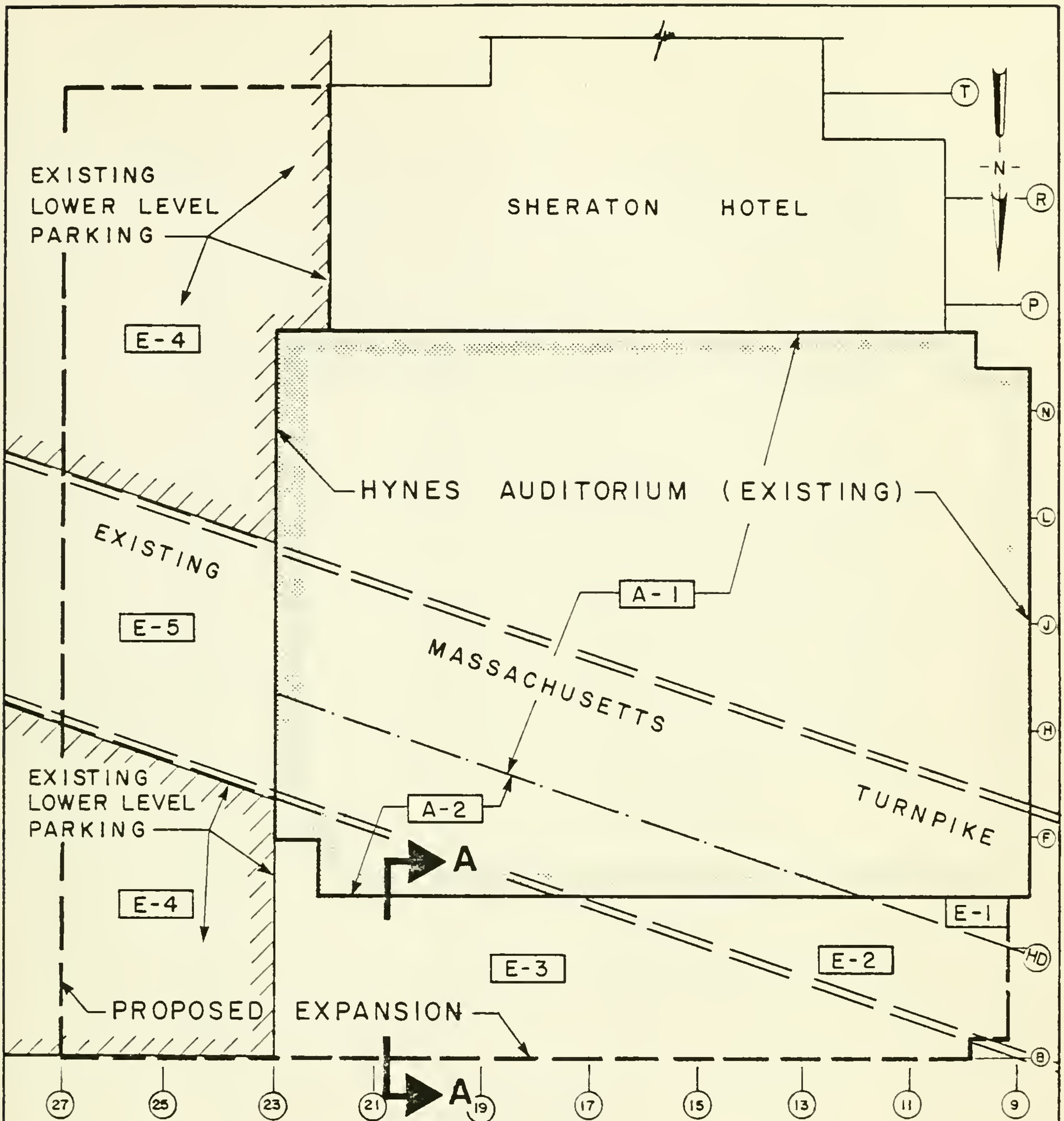
4. The effects of the proposed addition on the existing Boylston Street Subway will have to be evaluated.

D. PHASING

In order for the proposed expansion to proceed as quickly and economically as possible, the foundations of the existing structures will have to accommodate the loads imposed by the expansion. Supplementing the existing foundations is an expensive and time consuming process. As first order work, it is therefore suggested that the foundations of all the existing structures be thoroughly reviewed and analyzed. Prior to any construction, it is recommended that the additional investigations, as outlined in Section C.2, be performed.

In order that the existing Auditorium remain operational, it is understood that the proposed renovations will be completed in three (3) phases. However, once construction begins, it is recommended that all new and supplementary foundations (if necessary) be installed as first order work during Phase One, if possible. This recommendation is made since it is our opinion that it would be more economically advantageous to install all the new and supplementary foundations during the initial Phase and have the construction complete rather than have to incur the expense of several mobilization costs and Contractor inefficiencies.

This is particularly recommended for the new foundation construction in AREA E-3, where it is understood that the construction in this area will be completed in two (2) phases, Phase Two and Three. Again, if construction can be scheduled such that the new foundations in this area can be completely installed during the initial phase, it would be more efficient to the Contractor and less expensive.



AREA	FOUNDATION TYPE
A-1	CONCRETE-FILLED STEEL PIPE PILES; 16 IN. DIA. X 3/8 IN. WALL
A-2	STEEL H-PILES; 14 BP 117 LB.
E-1	CONCRETE-FILLED STEEL PIPE PILES; 16 IN. DIA. X 3/8 IN. WALL
E-2	STEEL H-PILES; 14 BP 117 LB.
E-3	NO EXISTING FOUNDATION; EARTH FILL SUPPORTS RING ROAD
E-4 (2 Areas)	REINFORCED CONCRETE MAT; SOIL-BEARING BELOW EXISTING LOWER LEVEL
E-5	CONCRETE-FILLED THIN-SHELL PILES; 12 IN. DIA. "COBI" TYPE

PROPOSED HYNES AUDITORIUM EXPANSION

EXISTING FOUNDATION TYPES

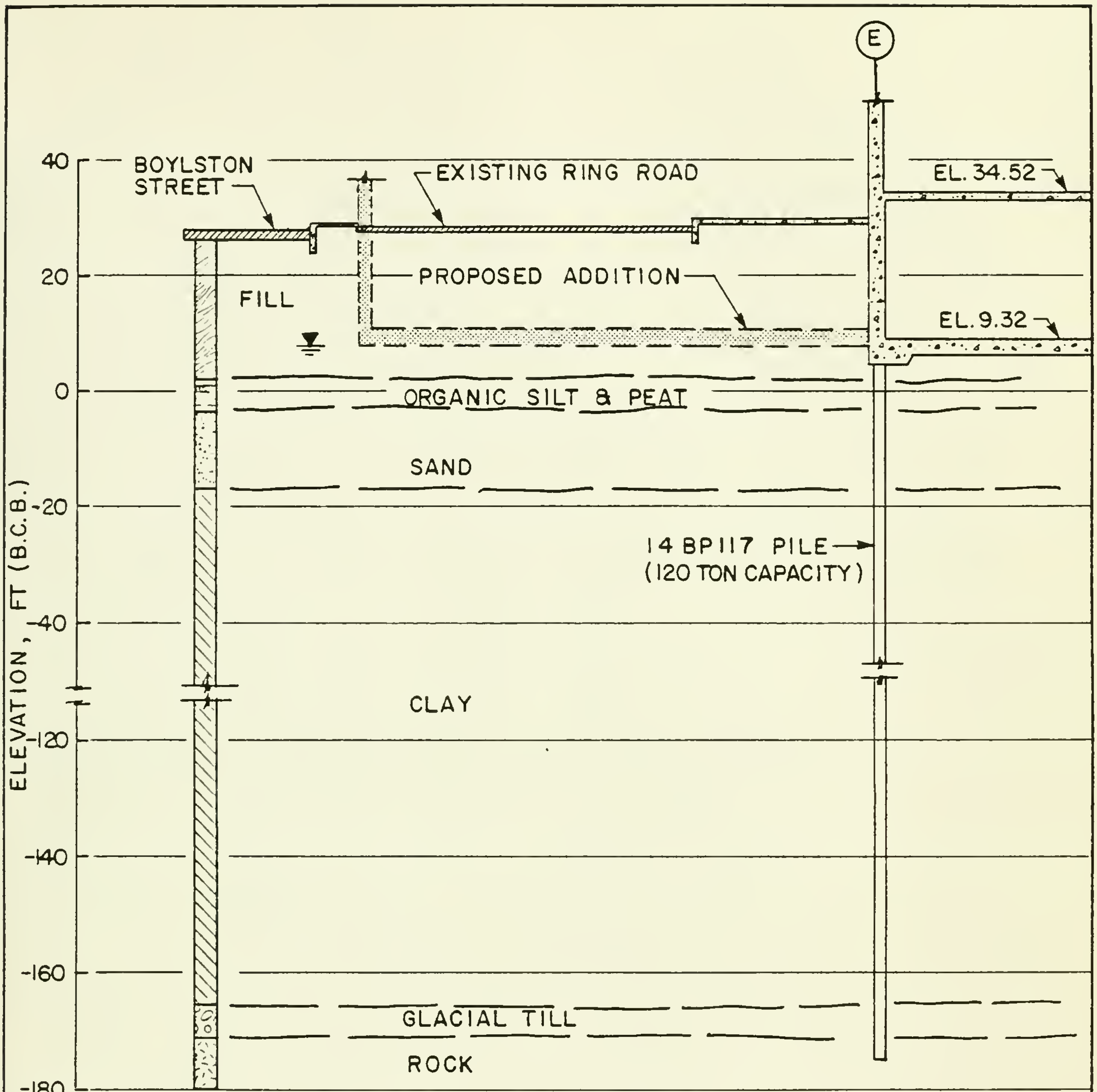
0 15 30 60
SCALE IN FEET

DECEMBER 1982

FILE NO 4964 A2

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

FIGURE 1



SECTION A-A

0 5 10 20
SCALE IN FEET

NOTE:
FOR LOCATION OF SECTION A-A REFER TO FIGURE 1

PROPOSED HYNES AUDITORIUM EXPANSION

TYPICAL SECTION

SCALE: AS SHOWN DECEMBER 1982

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

FILE NO. 4964 A3

FIGURE 2

Structural

1. Existing Conditions & Development

Weidlinger Associates

HYNES AUDITORIUM EXPANSION

STRUCTURAL REPORT

INDEX

SUMMARY

The structural portion of the expansion of the Hynes Auditorium, as outlined in this report and shown on drawings SK-1 through SK-5 is feasible, and considering the constraints given by the site and existing structures, also economical. Maximum advantage was taken of excess capacities in existing foundations and structural systems, and costly modifications and strengthening of these systems was kept to a minimum.

The next phase of the project should include further development of the suggested structural system.

EXISTING SYSTEMS

References

The following drawings were made available to us and form the basis for our report:

1. Structural drawings F-1 through F-41 for "Municipal Auditorium" by Hoyle, Doran and Berry, Inc. dated Jan. 8, 1962.
2. Structural drawings for "Prudential Center - Plaza, Subterranean, Commercial Center Section" by Charles Luckman Associates, Architects; Metcalf & Eddy, Inc., Engineers; and Edwards & Hjorth, Structural Engineers dated July 1, 1961.
3. Structural drawings for "Dalton Street Bridge" by Metcalf & Eddy, Inc. dated Jan. 31, 1964.
4. Drawings for "Boston Extension Section No. C-5" - Massachusetts Turnpike Authority by Howard, Needles, Tammen and Bergenhoff without date but stamped "As-Built Plans".

These drawings give a complete picture of existing foundation and superstructure conditions in the affected area. As far as could be observed, no substantial difference exists between the drawings and actual conditions.

Existing Structural Systems

The typical bay for the entire complex is 30' x 30'.

1. Hynes Auditorium and the Turnpike in front of the Hynes toward Boylston Street (Area 5).

   The foundation system is described in the Haley and Aldrich report (Figure 1, Areas A1, A2, E1 and E2).

   The basement slab (El. 9'-6 and El. 12'-10 1/2) is a reinforced concrete slab spanning between pile caps.

   First floor framing (El. 34'-9") is a reinforced concrete waffle slab (Depth - 15 1/2") supported by concrete columns, with the exception of the area over the Turnpike which consists of a concrete slab supported by steel beams, girders and columns. The same type of framing exists in the triangular area of the Turnpike projecting outside the Hynes supporting Ring Road.

To accommodate the clearance requirements of the Turnpike below, and the 30' x 30' building grid above, a complex steel transfer system was constructed in this area.

Design live loads:

Main Exhibition area	-	250 psf
Main Lobby and Small Rooms	-	150 psf
Stairs	-	100 psf
Area under Ring Road	-	Highway load

The second floor framing (El. 54'-9") is a reinforced concrete waffle slab (Depth - 15 1/2") supported by concrete columns with square column caps. The balcony framing for the auditorium is structural steel.

Design live loads:

Meeting Rooms, Lobbies, Small Rooms	-	150 psf
Main Exhibition area	-	250 psf
Stairs	-	100 psf
Balcony	-	100 psf
Balcony Trusses	-	75 psf

Above the second floor, the structure changes to a steel frame.

The framing for the Mechanical Room (El. 75') is a 5" thick reinforced concrete slab supported on steel beams and girders. All roof areas (low roof El. 75', intermediate roof El. 81", high roof El. 97") are framed by 2 1/2" thick light weight concrete planks supported by steel beams, girders and columns.

Design live loads:

Mechanical Room	-	100 psf
Roof	-	30 psf

In general, the documents show a well designed and detailed building. Excess capacities, especially in the concrete structure, allow additional loads to be carried. The additional capacity is the result of some over-design of the original building, but mostly due to the building code changes that have taken place since 1962. The change from working stress design to ultimate strength design for concrete structures is most helpful in justifying excess capacities and allowing the building expansion by adding additional floors.

2. Area in front of Block C (Area 2):

   Foundation for this area is described by Haley & Aldrich (Figure 1, Area E-4). The existing structure is a one-level, below-grade concrete structure. The design live load for the street level slab is the Standard Highway Loading.

3. Block C and West Court (Area 3 and 4):

   Foundations for these areas are described by Haley & Aldrich (Figure 1, Areas E-4 and E-5).

   Basement (El. 3'-0") - Framing is a reinforced concrete mat.

   Street Level (El. 17'-4 1/2") - Structure for this level consists of a reinforced concrete flat slab with dropped panels supported by concrete columns. This level does not exist within the limits of the Turnpike.

   Plaza level (El. 38'-1") - is framed by a 5 1/2" concrete slab supported by steel beams, girders and columns. A steel girder transfer system exists over the Turnpike, similar to the system under the Hynes Auditorium.

Design live load	-	100 psf

Roof (El. 58) - The roof is framed by metal deck, steel beam, girders and columns. The mechanical area has a 4" light weight concrete slab between steel beams.

Design live load:

Roof	-	40 psf snow
Mechanical Room	-	120 psf

PROPOSED EXPANSION

The scope of the proposed expansion, as indicated on attached drawings SK-1 through SK-5 is the result of the combined effort of architects and engineers to accommodate the building program. Within the existing building limits, excess capacities of structural elements and foundations were identified. These capacities are used, sometimes to the upper limit, to create new spaces on top of existing structures. The load limitations imposed by foundations and existing framing, result in the proposal that all new spaces should be created using the lightest possible construction method. A lightweight concrete slab on metal deck supported by a structural steel frame for floors, and metal deck on structural steel for roofs, fullfills this requirement.

In the following, the proposed structural solutions are described area by area:

1. Area 1 covers the expansion in front of Hynes Auditorium toward Boylston Street. Foundation implications are covered in Haley & Aldrich report (Areas E-1, E-2 and E-3).
   The proposal calls for a three-story steel structure (El. 34'-10", El. 54'-10" and El. 74'-10") with a basement in the area outside the Turnpike (El. 10'-10"). The new building is structurally not tied to the existing building, but is supported by its own columns. Lateral loads (wind and seismic forces) are resisted by moment frames.
   The most difficult area, design and construction-wise, is the triangular area where the new building is located over the Turnpike (Lines 8A to 18 and GE to E). The existing foundations, columns and framing over the Turnpike restricts severely the expansion possibilities. The placement of the entrance atrium in this area is in response to these limitations. Even then, strengthening or replacement of some elements of the existing system (girders and columns) will be required. The effect of this work on the operation of the Massachusetts Turnpike was considered and discussed with the Turnpike Authority.
   The compatibility of the mat foundation proposed by Haley & Aldrich (Area E-3) with the pile foundations (Area E-1 & E-2) will have to be investigated. Otherwise the structure in Area 1 is anticipated to be of standard structural steel construction.
2. Area 2 covers the expansion in front of Block C. The planned building volume is similar to Area 1 with an additional level inserted at elevation 22'-10" (see SK-2). As outlined in the Haley & Aldrich report, it is intended to reuse the existing mat foundation (Area E-4). A new standard steel structure would be founded on this mat. No special problems are anticipated in this area.
3. Area 3 and Area 4 cover construction in the Block C and West Court area. Foundation implications are covered by Haley & Aldrich under Areas E-4 and E-5. The intended expansion involves the demolition of the existing steel structure above elevation 38'-1" and construction of an additional level (El. 54'-10") with a roof at El. 74'-10".

The limited load capacities of existing foundations, columns and girders in the area over the Turnpike dictate a special framing system for the expansion in this area (See SK-3). The column location for framing supporting the floor at El. 54'-10" will be according to columns and walls in the Turnpike. This way the existing transfer framing at El. 38'-1" can remain in place. Elsewhere a standard steel structure is anticipated.

4. Area 5 covers construction within and on top of the existing Hynes Auditorium. The foundation aspect is covered by Haley & Aldrich under A-1 and A-2. The scheme proposed involves the demolition of the existing steel structure above El. 54'-9" in the areas where an additional level is planned. A new steel frame starting from the concrete structure at El. 54'-9" will form the additional level at El. 74'-10". Special consideration has been given again to the area where the expansion overlays the Turnpike.

   It is intended to abandon the existing auditorium and fill in the orchestra pit at El. 34'-10" and the void at Level 2 in the auditorium area with a new steel floor to increase the exhibition space. This involves the demolition of the existing balcony framing including the surrounding concrete framing at El. 61'-6". Along Dalton Street a new two level structure is planned to accommodate mechanical equipment.

5. The following design live loads were assumed in the structural design for the project:

Main Exhibition area	-	250 psf
Lobby, Meeting Rooms, Stairs and Small Rooms	-	100 psf
Roof	-	30 psf snow + drift load
Mechanical Spaces	-	Specified Equipment Weight

   These load assumptions apply to new structures, additional floors and remaining existing floors.

   For wind loads, the design is based on the provisions of the Massachusetts State Building Code.

   For seismic loads the design is based on the following assumptions:

   1). All new structural elements (foundations, new buildings, additional floors) are designed according to the Building Code provisions.

2). Existing structural elements which are to remain (foundations, concrete and steel structures) will not have to be updated for the current seismic requirement.
In 1962, at the time of the original construction, no seismic provisions were required by the Building Code.

Options and Recommendations

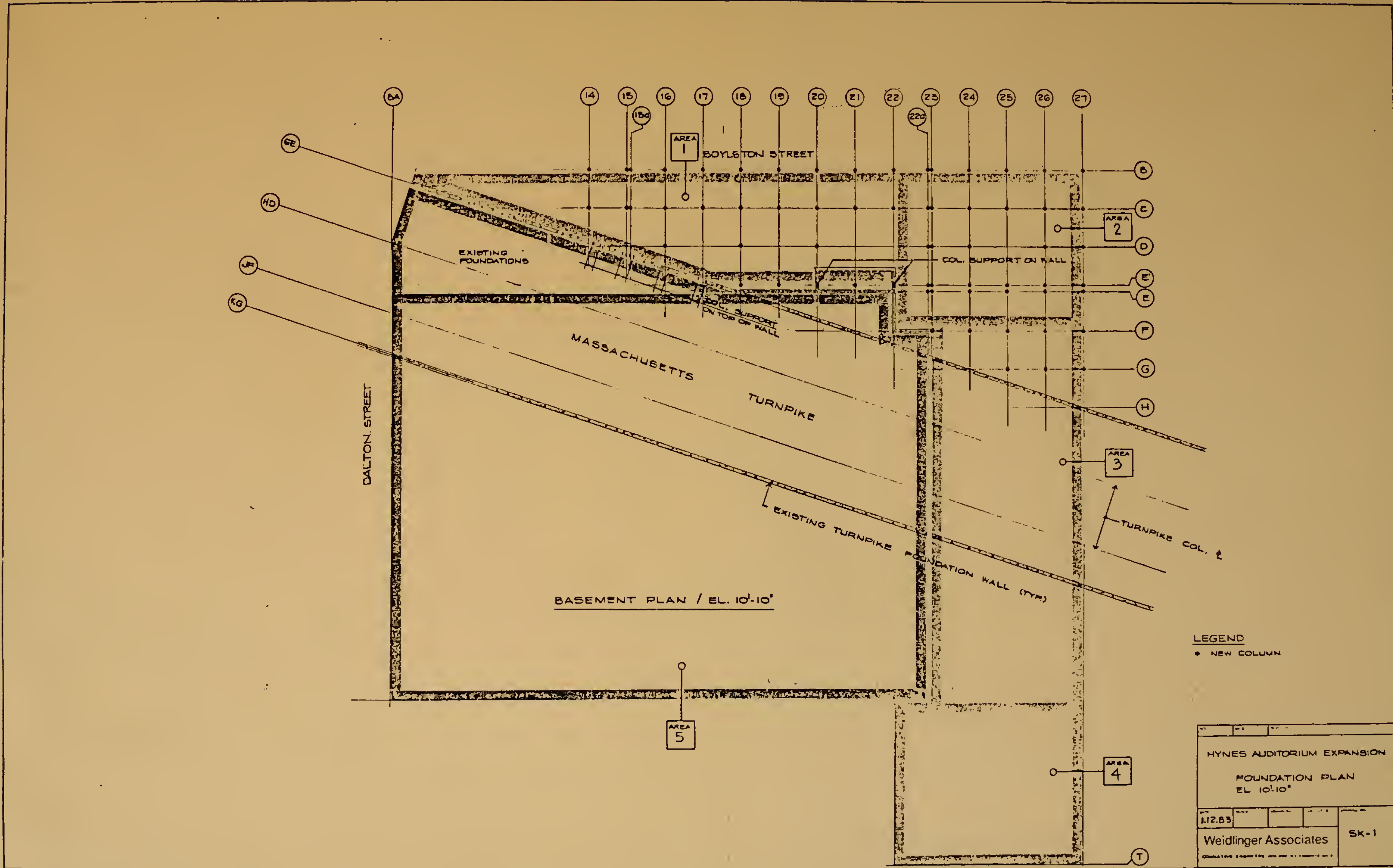
The load limitations of existing foundation and superstructure dictate the structural system for the addition.
A concrete system would be substantially heavier, therefore a steel system is recommended. During the further development of the project all elements that contribute to the building weight, such as exterior walls, floor finishes and interior partitions, will have to be controlled so that existing elements are not overloaded. For the same reason, the assumed design live loads, as listed under "Proposed Expansion", cannot be changed without further investigation.
Increase of the design live load for meeting rooms from 100 psf to 150 psf will be possible in some cases, but difficult to achieve in others.
We recommend that the next phase include the following items:

1). A survey of the existing structure should be undertaken to verify if any difference exists between conditions shown on drawings and field conditions. Items to be covered should include dimensions, elevations, member sizes, etc.
2). It should be attempted to locate additional drawings and addenda to the construction documents of the Hynes Auditorium. These documents are mentioned on the drawings in our possession and might be useful to clarify existing conditions.
3). Design assumptions have to be clarified and agreed on by all parties. This should include the design live load assumptions and the interpretations of the Building Code requirements for seismic design for existing structures. Our present design assumptions are listed under "Proposed Expansion".

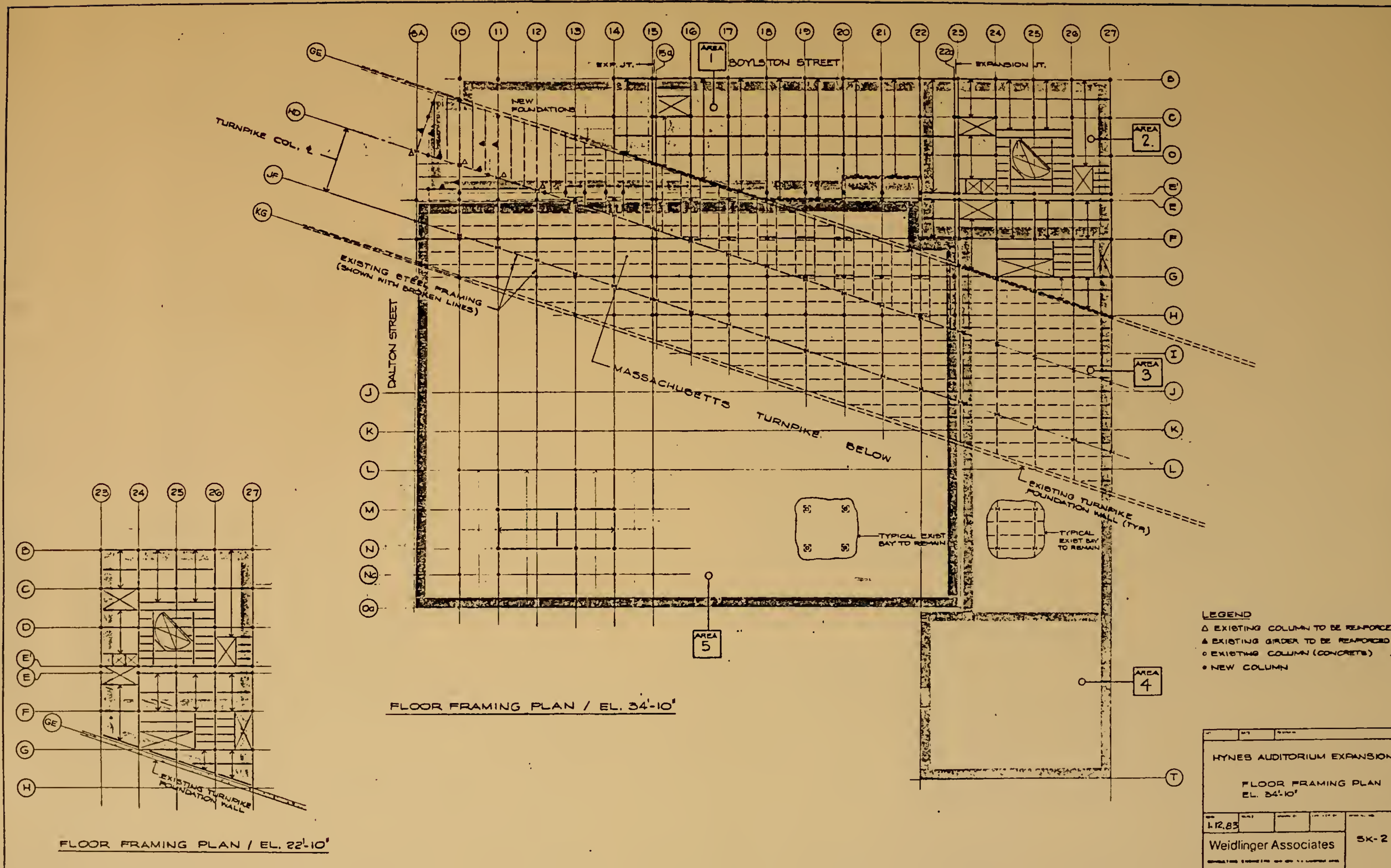
4). Coordination with the Massachusetts Turnpike Authority is required. The interference of the construction activity with the traffic of the Turnpike has to be addressed and parameters for restrictions for traffic or construction have to be worked out.

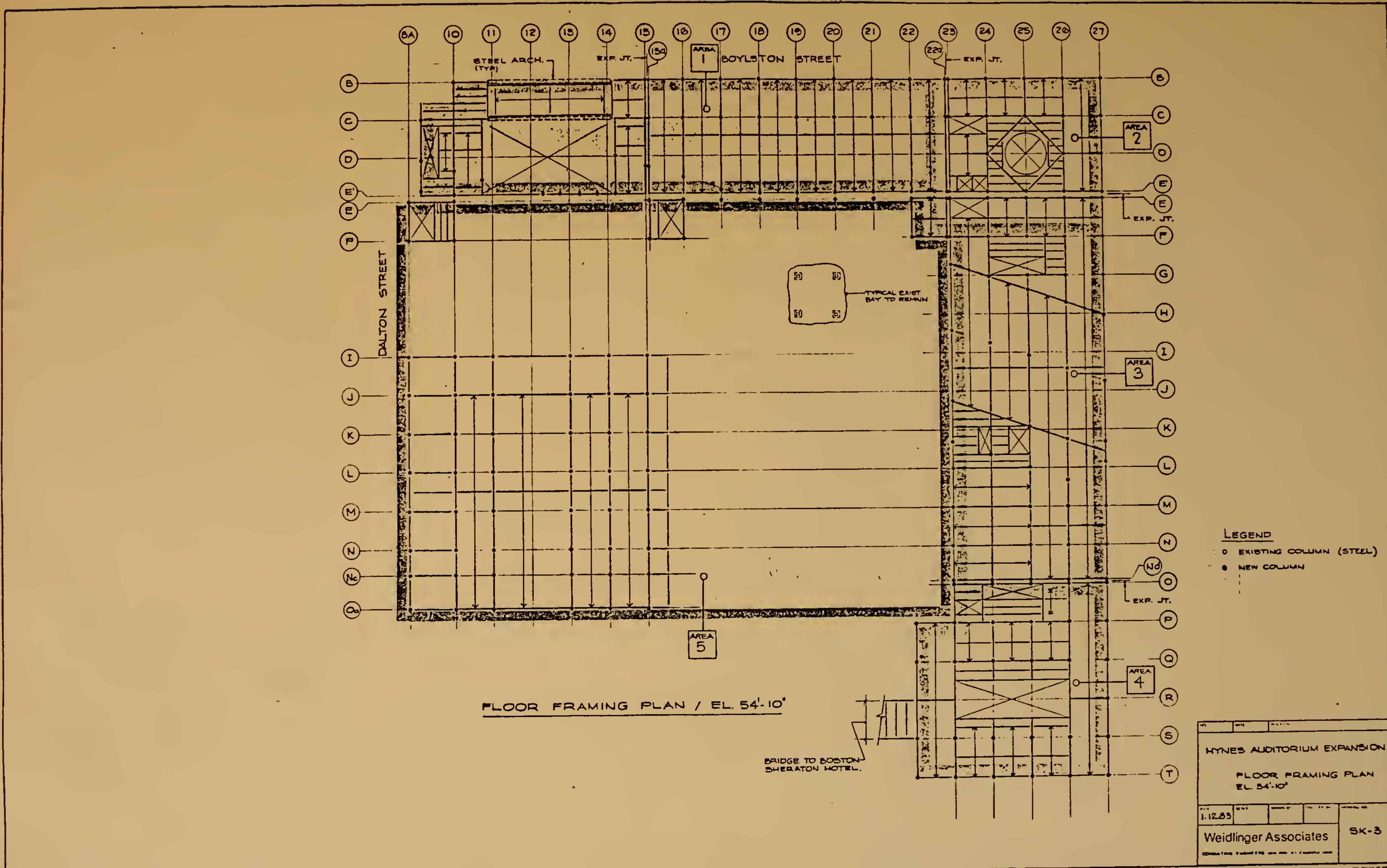
PHASING

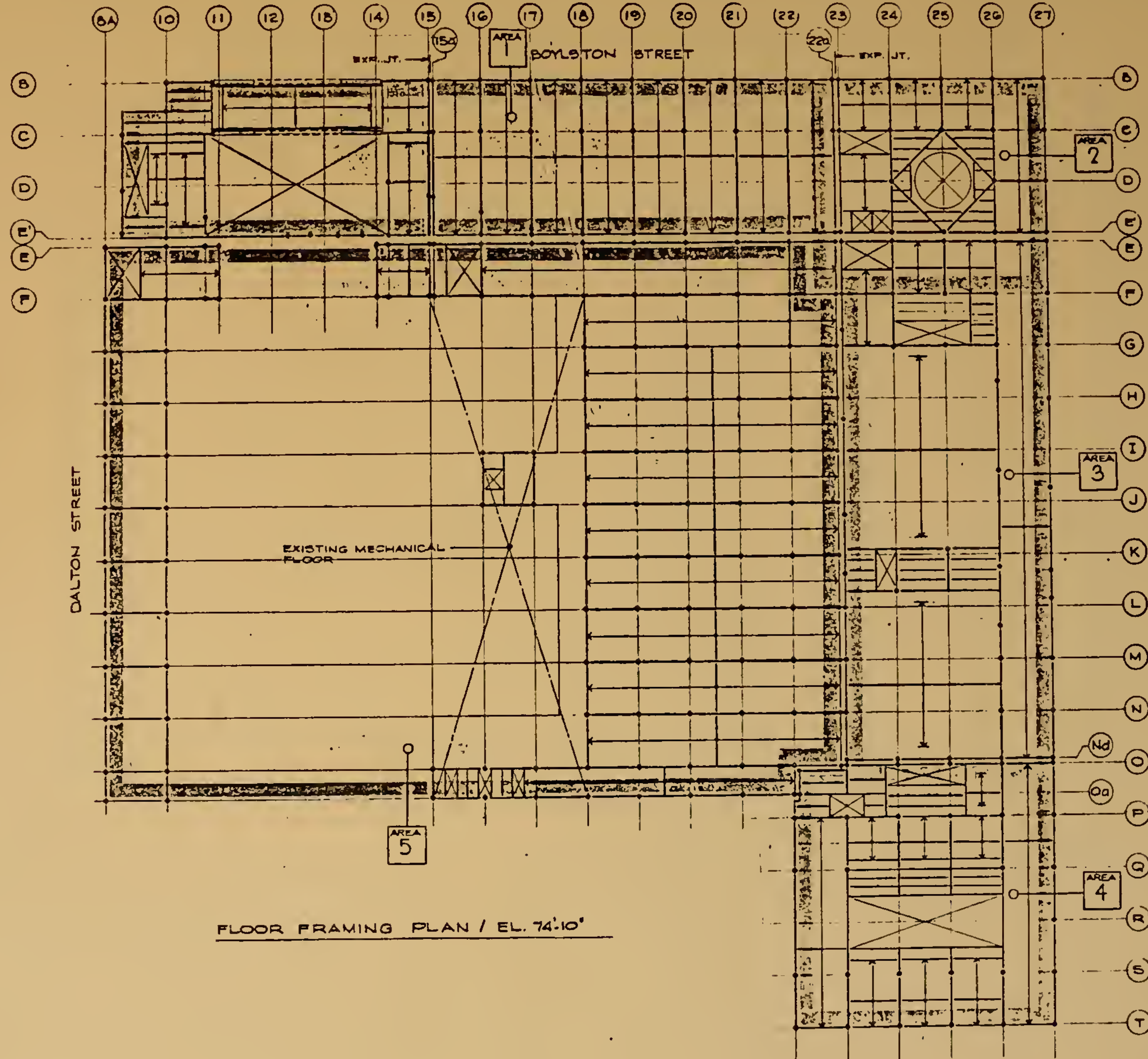
The construction of the project in three phases can be accommodated. Expansion joints will be located along phasing lines to permit the construction of the individual phases as independent units. As recommended by Haley & Aldrich, it might be advantageous to build new foundations and portions of the structure for Phase II and III in the area facing Boylston Street, at the same time.



BOYLSTON STREET
DALTON STREET
EXISTING FOUNDATIONS
COL. SUPPORT ON WALL
COL. SUPPORT ON TOP OF WALL
MASSACHUSETTS TURNPIKE
EXISTING TURNPIKE FOUNDATION WALL (TYP.)
TURNPIKE COL. ℄
BASEMENT PLAN / EL. 10'-10"
AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
LEGEND
• NEW COLUMN
HYNES AUDITORIUM EXPANSION
FOUNDATION PLAN
EL 10'-10"
1.12.83
Weidlinger Associates
SK-1


BOYLSTON STREET
EXP. JT.
EXPANSION JT.
NEW FOUNDATIONS
TURNPIKE COL. ℄
EXISTING STEEL FRAMING (SHOWN WITH BROKEN LINES)
DALTON STREET
MASSACHUSETTS TURNPIKE BELOW
EXISTING TURNPIKE FOUNDATION WALL (TYP.)
TYPICAL EXIST BAY TO REMAIN
TYPICAL EXIST BAY TO REMAIN
AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
LEGEND
△ EXISTING COLUMN TO BE REINFORCED
▲ EXISTING GIRDER TO BE REINFORCED
○ EXISTING COLUMN (CONCRETE)
• NEW COLUMN
FLOOR FRAMING PLAN / EL. 34'-10"
EXISTING TURNPIKE FOUNDATION WALL
FLOOR FRAMING PLAN / EL. 22'-10"
HYNES AUDITORIUM EXPANSION
FLOOR FRAMING PLAN EL. 34'-10"
1.12.83
Weidlinger Associates
SK-2


BOYLSTON STREET
DALTON STREET
STEEL ARCH. (TYP)
EXP. JT.
AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
TYPICAL EXIST BAY TO REMAIN
BRIDGE TO BOSTON SHERATON HOTEL.
LEGEND
EXISTING COLUMN (STEEL)
NEW COLUMN
FLOOR FRAMING PLAN / EL. 54'-10"
HYNES AUDITORIUM EXPANSION
FLOOR FRAMING PLAN EL. 54'-10"
1.12.83
Weidlinger Associates
SK-3



FLOOR FRAMING PLAN / EL. 74'-10"

LEGEND

• NEW COLUMN (STEEL)

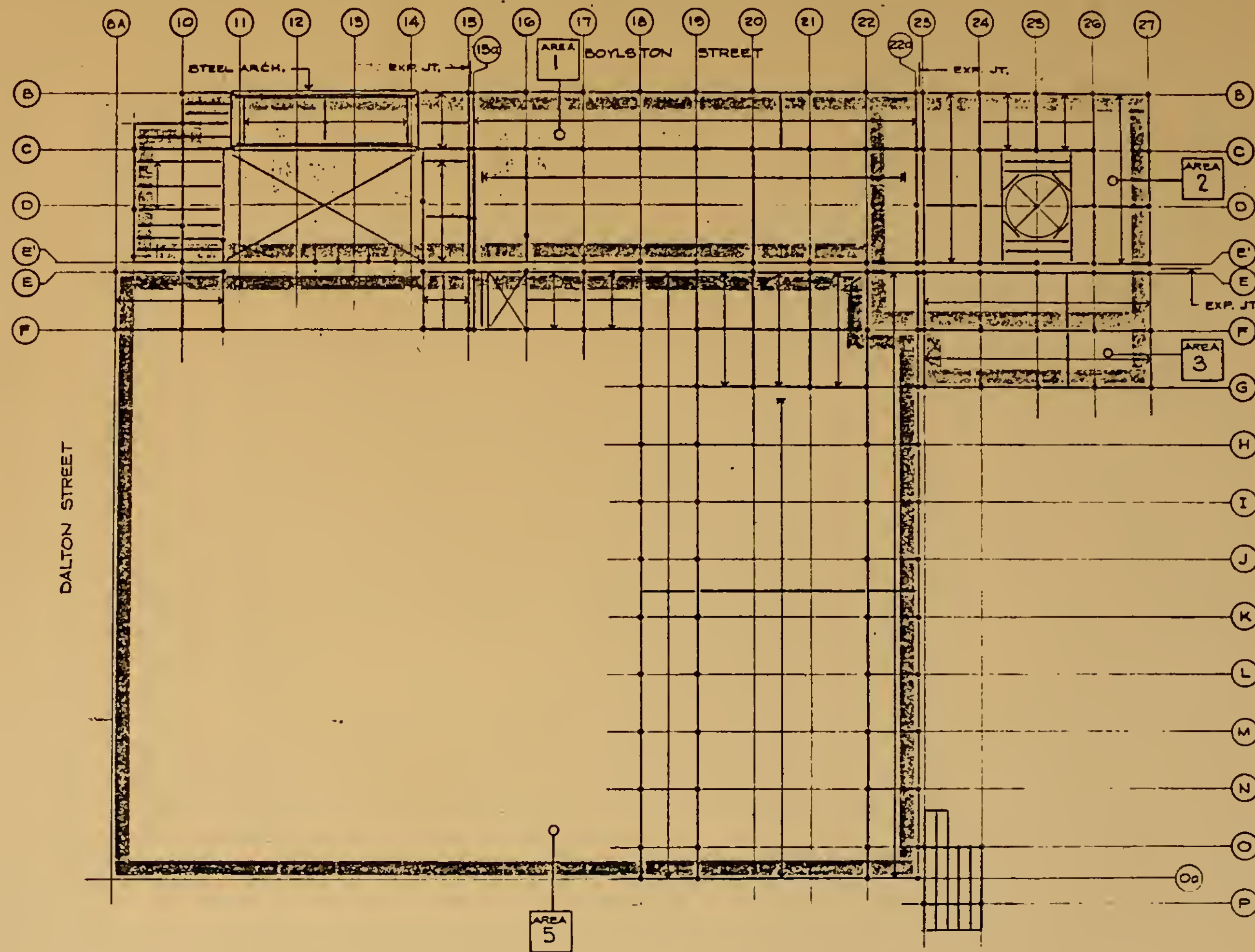
HYNES AUDITORIUM EXPANSION

FLOOR FRAMING PLAN
EL. 74'-10"

1.12.83

Weidlinger Associates

SK-4



ROOF FRAMING PLAN / EL. 94'-10"

LEGEND

• NEW COLUMN (STEEL)

HYNES AUDITORIUM EXPANSION

ROOF FRAMING PLAN
EL. 94'-10"

1.12.83

Weidlinger Associates

SK-5

Heating, Ventilating & Air Conditioning

1. Existing Conditions & Development

TMP Consulting Engineers, Inc.

HYNES AUDITORIUM

HEATING, VENTILATING AND AIR CONDITIONING

INDEX

I. SUMMARY

This report reviews the existing systems, their capacities, conditions and the impact of the proposed expansion on these systems. Major new construction, renovation, and space usage dictates the need for revamping of much of the existing system as well as the need for much greater flexibility. Capacities for the central cooling and heating plant also must be enlarged accordingly. The choices available for the type of system and fuel source have been outlined but final decisions are beyond the scope of this report. These decisions require extensive studies which will be outlined in a future proposal. The importance of this Study in selecting the right system cannot be overemphasized because a building of this nature whose utility and maintenance costs are such a high percentage of its operating budget requires the most energy efficient and low maintenance available to keep costs controllable. The increase of the Hynes utility and maintenance budget will not be in direct proportion to the increase in square footage. Newer, more efficient, more flexible systems will be able to maintain comfort conditions at a lower square foot costs(per hour of use).

Phasing of construction has also been reviewed and determined not to present any serious problems relative to allowing the Hynes to function during the construction period.

Our inspection of the existing systems and the related interface to the new equipment during phased construction reinforces our opinion that with careful preparation and coordination of design documents and alert construction supervision, the final project will be a highly efficient and flexible environmental control system that provides the required comfort to the wide range of uses envisioned for this facility.

II. EXISTING SYSTEMS

A. General

1. The existing system, designed in 1962, is composed primarily of steam powered equipment. Edison steam enters building at 100 psig. Air conditioning is accomplished via steam driven turbines that produce electricity that power the electric chillers. Heating is accomplished via steam directly, steam to hot water convertors and some electric duct heaters.

B. Capacities : (Scheduled Capacities From Original Documents)

1. Air Conditioning:
   a. The design parameters for cooling equipment were 92°F outside dry bulb; 75°F wet bulb. Inside design was 80°F db, 40°F relative humidity.
   b. The air conditioning system consists of two 100 psig steam driven turbines that power two chillers. The chillers are 500 tons and 1000 tons respectively. Chilled water is circulated throughout building to various cooling coils (predominantly in the penthouse mechanical room) via three (3) chilled water pumps. Two pumps are active and one is a standby. These pumps are rated as shown in Table 2 of the Appendix. Chilled water is delivered to the coils at 42°F and returns at 52°F.

II. B. 1. b. Cont'd.

Three condenser water pumps (2 active, 1 standby) circulate condenser water between the chiller and the cooling towers for final heat rejection. Condenser water pumps are rated as shown in Table 2 Appendix. The cooling tower receives water at 105°F and returns it to the chiller at 85°F.

2. Heating:

a. The design parameters for heating used in the original design were 0° outside air and 65° or 70° for indoor design, depending on the space.

b. Steam is delivered to a series of pressure reducing valves stations at 100 psig and reduced to 40 psig in PRV-1, PRV-2 and PRV-3. PRV-1 is sized at 6000 lbs/and was originally intended for exhibitor"s use. The medium pressure steam is distributed to various floor boxes for use by exhibitors. This has since been discontinued. PRV-2 is sized at 21750 lbs. steam/hr. and is the main service for building heating. PRV-2 is in series with PRV-4 which reduce the steam from 40 psig to 10 psig. PRV-3 is sized at 2600 lbs. steam/hr and serves the domestic hot water. PRV-3 is in series with PRV-5 which also reduces 40 psig steam to 10 psig. PRV stations are located in basement mechanical rooms in Room B-14. Therefore, of the 30350 lbs. steam/hr entering the building, 21750 (or 72%) is for building heating.

c. Major building heating loads can be divided into two basic groups: actual heat loss of building envelope and preheating and heating of ventilation air.

II. B. 2. c. cont'd.

Heat losses are offset by combination of steam and hot water radiation, unit heaters and convectors. Air heating is done by steam, hot water preheat, reheat coils, and electric booster coils with steam being the predominant medium used.

d. The preheat load was originally designed for 6612 lbs. steam/hr. This load has been reduced through reduction of outside air. The original load was based on standard ventilation rates and outside air percentages for the time it was designed but those numbers have been significantly reduced since the energy crisis.

(1) During this phase of study of the Hynes, a balancing contractor (Thomas-Young Associates, Inc.) was selected from three proposals, to take readings of existing conditions to determine the operating conditions of the major equipment. One major conclusion of his report shows outside air reduced to 28% as its original specified amount.

e. Hot water is circulated from convertors to unit heaters, hot water radiation, and freeze protection circuits of major air handling units throughout the building. Six heating pumps (one standby, five active) serve the five convertors. See Table 2 for list of heating pumps.

f. In addition to heating equipment specified above, there are electric booster coils (duct mounted) totalling 290 KW.

g. Refer to Table 1 on page 31 for existing steam loads.

II. B. 3. Ventilation:

a. General - Ventilation and air distribution is delivered via air conditioning systems (supply and return fans), exhaust fans, and heating and ventilating units.

b. Air Conditioning Systems:

(1) Twelve major air conditioning units designed for 431,965 cfm of air delivery with 42% outside air. (Actual present day operating conditions are 278,168 cfm with 18% outside air. This will be discussed later in report.)

(2) The major air handling units are custom built draw-thru units composed of: steam preheat coils that heat the air from 0°F to 45°, 50° or 60° depending on area served; filter section; spray coil dehumidifiers; centrifugal supply and return fans with inlet vanes; duct mounted steam reheat coils that raise temperature of air to 65°, 70° or 75°F depending on area served. Air is discharged into a supply plenum and is then distributed to various pressure and veocity reducing terminal boxes before discharging to space via air outlets.

c. Heating and Ventilating Units:

(1) Eight heating and ventilating units provide ventilation for basement shops, transformer vault, trucking area and penthouse. The combined capacity of these units are 74330 cfm

II. B. 3. d. Exhaust Fans:

(1) Twenty-five exhaust fans of a mixed variety including single width, single inlet centrifugals, cabinet fan sections; vent sets and belted propeller type provide toilet exhaust, general exhaust; exhibitors exhaust and mechanical room exhaust. These exhaust fans operate on different schedules depending on service. The capacity is 127,390 cfm.

e. Miscellaneous Equipment:

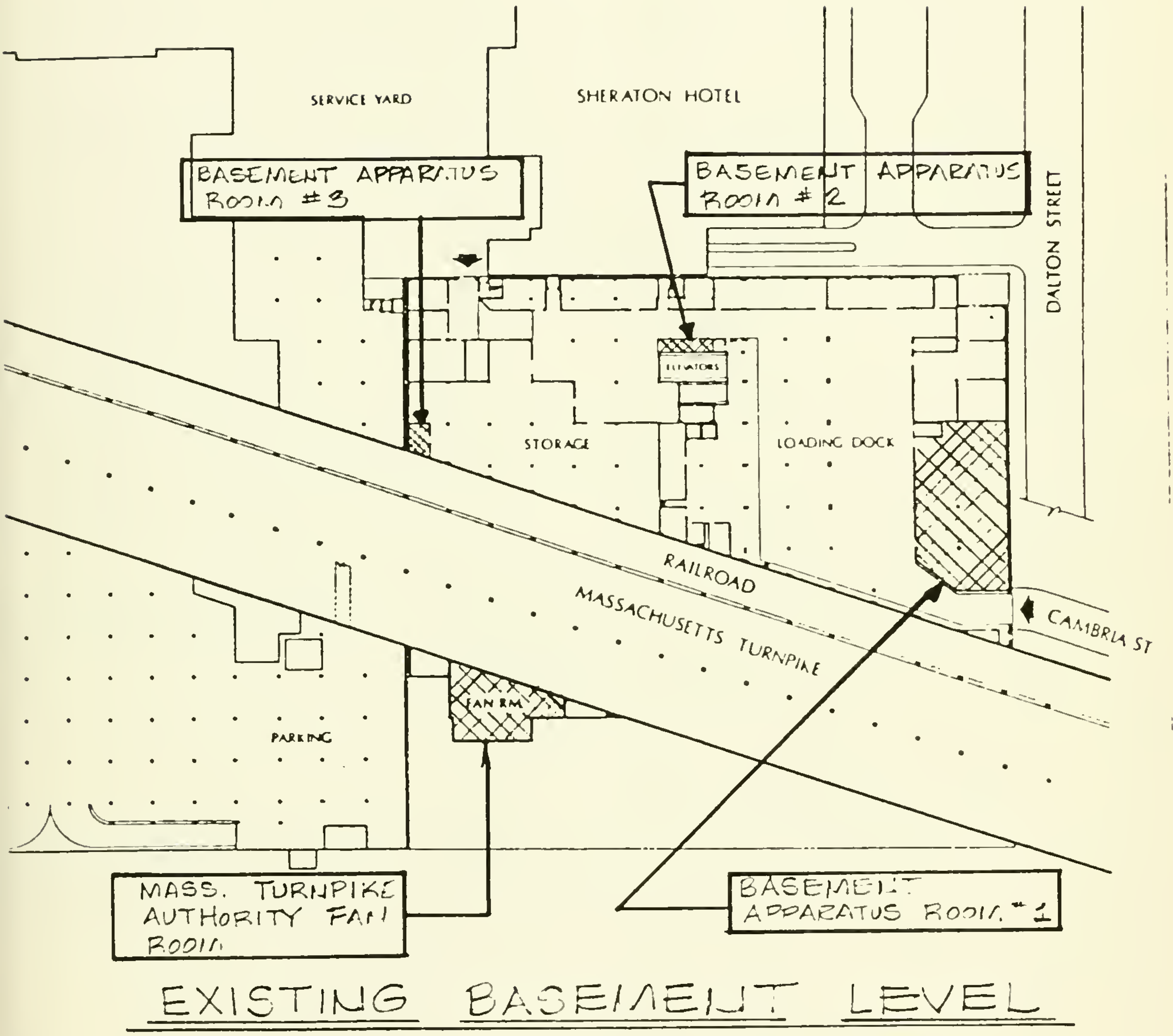
(1) Other equipment included in system's original design is: Multizone supply unit rated at 4310 cfm; Fifteen ton Package Water Chiller (condenser for this unit is cooled by city water). Air Conditioning Package Unit rated at 2440 cfm; and Multiple Fan Coil Units.

C. <u>Locations of Mechanical Equipment</u>:

1. Majority of mechanical equipment is located in Rm. B-14 denoted as Basement Apparatus Room #1 and Penthouse Mechanical Room 312.

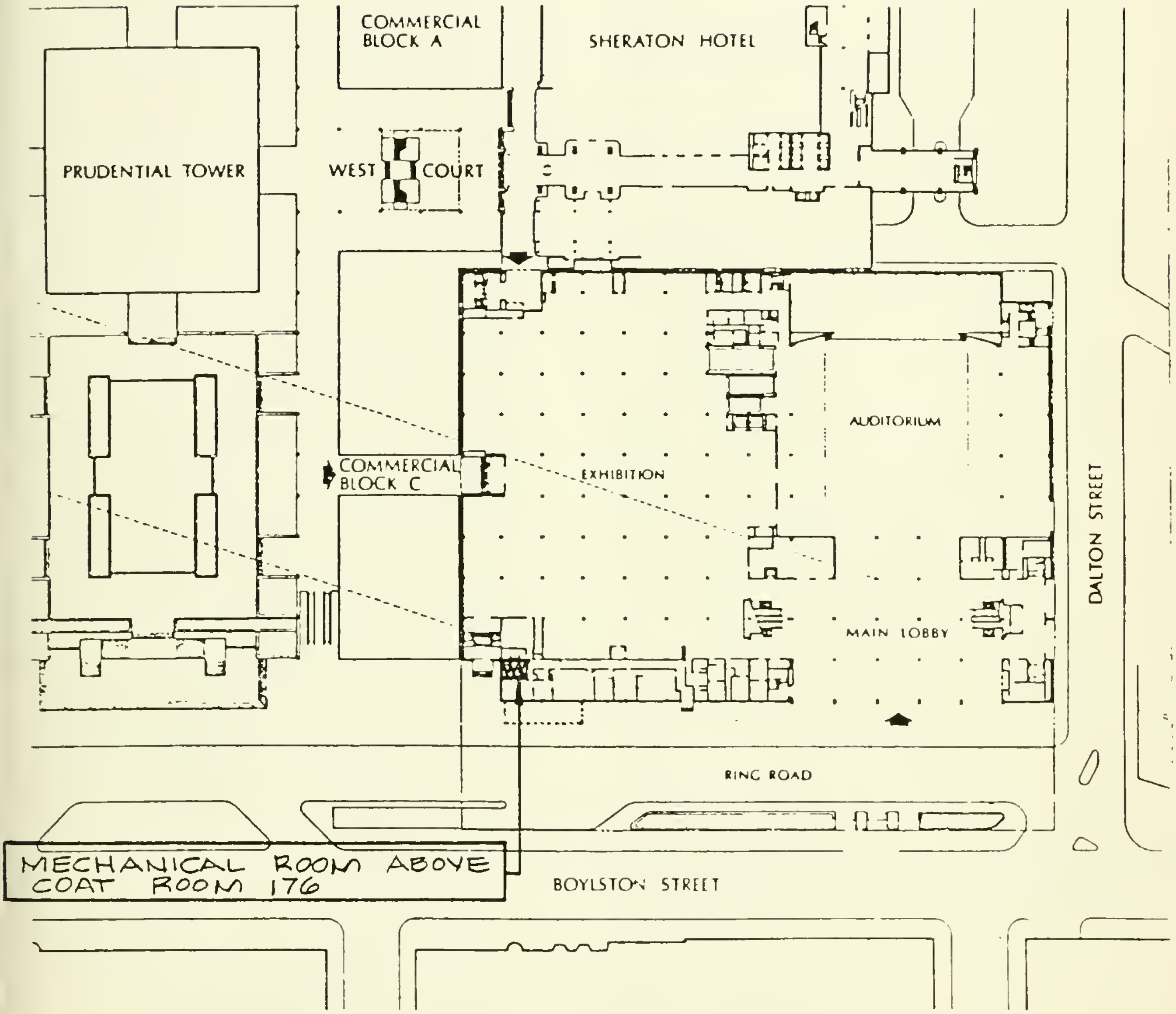
a. Equipment in the Basement Apparatus Room #1 (elev. 13'-0") includes two chillers; three chilled water pumps and three condenser water pumps; central automatic temperature control panel; pneumatic air compressors for temperature control system; pressure reducing stations for steam; duplex condensate pumps; surge tank; domestic hot water storage tanks and instantaneous heaters; and steam condensate meters. (Refer to SK-HVAC-1.)

SK - HVAC - 1



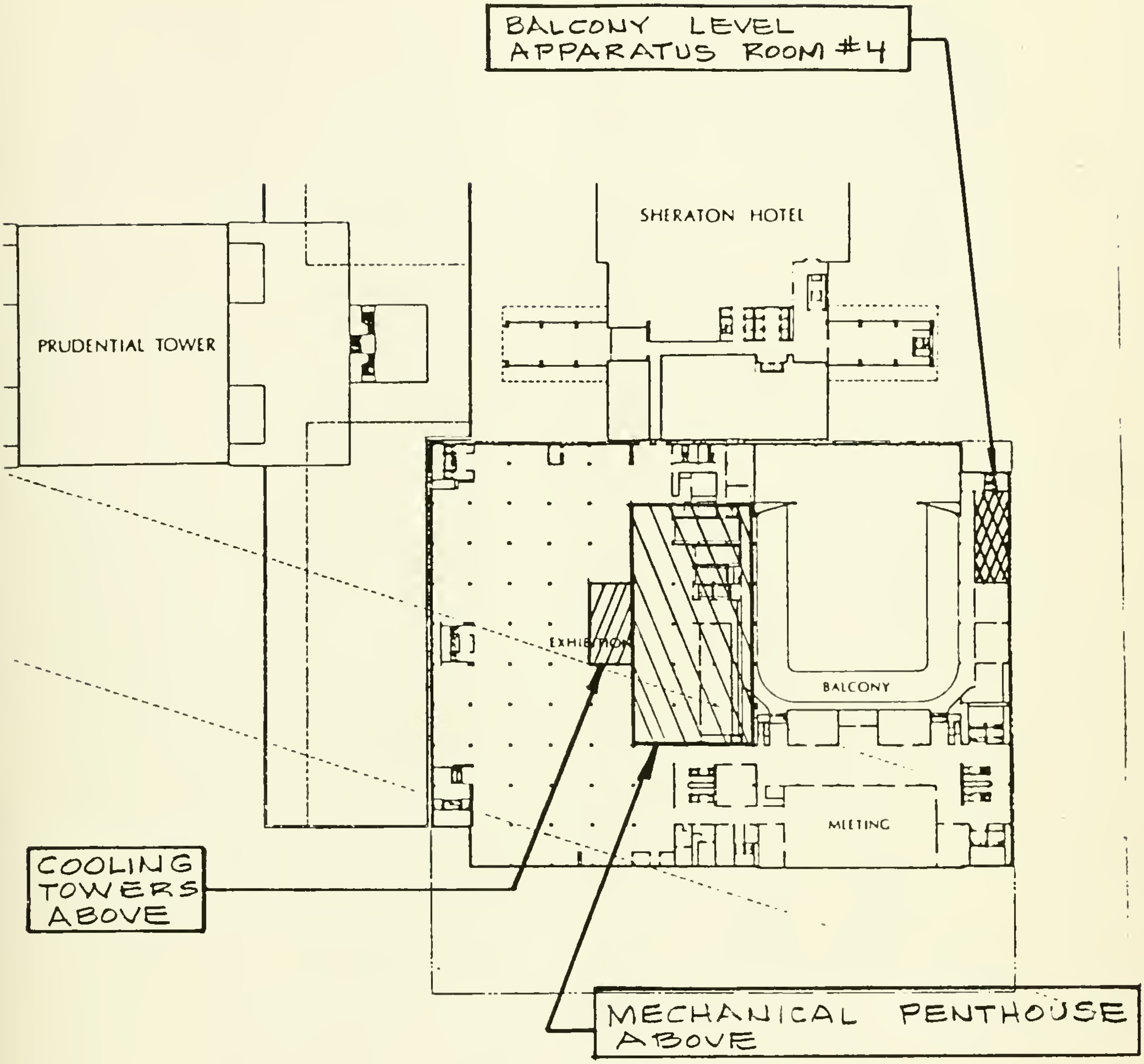
NOTES: 1. For description of equipment in these designated areas refer to Paragraph II.C.1.a., II.C.2., II.C.3., and II.C.6.

SK - HVAC - 2



EXISTING MAIN LEVEL

NOTES: 1. For description of equipment in this area refer to Paragraph II.C.4.



EXISTING 2ND LEVEL

NOTES: 1. For description of equipment in these areas refer to Paragraphs II.C.1.b., and II.C.5.

II. C. 1. b. Penthouse Mechanical Equipment Room
Room 312 (elev. 75'-4") contains eleven major air handling systems S-1 thru S-11 and R-1 thru R-11. Adjacent to this space are roof mounted cooling towers. Also included in Penthouse is Convertor #5 and associated hot water pump P-16 serving freeze protection system. (Refer to SK-HVAC-3.)

2. Room B-31 (elev. 13'-0") denoted as Basement Apparatus Room #3 contains Duplex Condensate Pump #2; small packaged water chiller; convertor #1 serving hot water heating system with hot water pumps P-11 and P-12. (Refer to SK-HVAC-1)

3. Room B-23 (elev. 13'-0"), Basement Apparatus Room #2 contains exhaust fans EX-1, EX-2 and EX-17. These fans provide general exhaust for basement area.

4. Coat Room 176 (elev. 45'-0"±) contains Air Conditioning Unit S-14 (2440 cfm) and Return Air Fan R-14 (1080 cfm). This small system serves administration area and has its own designated package chiller (located in Apparatus Room #3). Room also contains Convertors C-2 and C-3 and Hot Water Pumps P-13 and P-14 serving heating system. (Refer to SK-HVAC-2)

5. Room 235 (floor elev. @61'-6") designated as Balcony Apparatus Room #4 contains AC Unit S-12 (17,260 cfm); Return Fan R-12 (16,065 cfm); Multizone Unit S-13 (4,310 cfm); and Return Fan R-13 (4,010 cfm); Convertor C-4 and associated pump P-15 serving freeze protection system for S-12 and S-13 cooling coils. Unit #12 serves area below west balcony on first floor. Unit #13 serves Meeting Rooms 232, 233, and 234. (Refer to SK-HVAC-3.)

II. C. 6. Mass. Turnpike Authority Fan Room containing Tunnel ventilation equipment. (Refer to SK-HVAC-I.)

D. Condition of Equipment:

1. In general, the condition of the central equipment is poor and is quickly approaching its expected useful life. The maintenance costs are the best indicators of this fact. By completion of this project, the equipment will be 22 years old.
2. The reuse or replacement of specific equipment is a function of the effectiveness and maintenance cost of the system.
3. A review of the systems' maintenance contracts for the Hynes indicate a very steep escalation as the equipment ages. Table 4 on page 34 indicates the extent of the problem. It shows an escalation of 141.9% since 1977 and 29.4% in the last year alone.
4. In addition to maintenance costs, the operating costs of the system, as it now exists, must be considered vs. the reduction in operating costs per square foot of newer more efficient systems. Table 5 in the Appendix shows the trend in steam and electric unit costs. From June, 1979 to June, 1982, steam unit costs have risen 79% while electric unit costs have risen 81%. While no one can accurately predict future utility rates, we can determine in future studies the cost/square foot for different systems at today's known rates which will indicate strongly the economics of equipment replacement vs. reuse.
5. Future studies will include an in-depth review of maintenance contracts to determine which equipment has abnormal maintenance and repeated failures. This equipment when identified will be a strong candidate for replacement.

II. D. 6. Another study that will be performed is the testing of control systems to determine the overall condition and response of space temperatures to control settings.

7. One survey already concluded to determine existing conditions is a balancing report, (contained elsewhere in this submittal). The work was performed by Thomas-Young Associates in conjunction with TMP Consulting Engineers, Inc. to determine the present operating condition of the major air handling and pumping systems. The data in the report indicates that the velocity and pressure reducing stations used throughout the system are in poor condition resulting in reduction of air flow of most units. These units should be replaced in total. The present operating air delivery is only 63% of the original scheduled capacities. This explains in part the inability of the existing system to maintain comfort conditions during peak loading.

III. PROPOSED EXPANSION

A. General:

The expansion of the Hynes has significant impact on the existing HVAC system. The existing central cooling equipment sized at 1500 tons is obviously inadequate for the new load resulting from the doubling of floor area (but more than doubling of air conditioned area). The steam system serving the building will also be inadequate if the final system selected were to be all steam. The steam lines entering the building are adequately sized only if the steam is used for heating only. The routing of the steam line would require relocation. The program for expansior also encompasses higher heat gain levels for spaces, therefore requiring major renovations and relocation of ductwork to handle the more intensive square foot cooling requirements.

In addition, existing areas along North and East side of existing building shall require removal and revision to systems as new construction, demolition, and interface of old building with new building requires such work.

B. Third Level - Elevation 74'-10"

1. The ramifications of the expansion at this level are as follows:

   a. New Conference/Exhibition Hall at this level requires the removal of cooling towers and the removal of all ductwork located below the roof area being demolished.

III. B. 1. b. New elevator and passageway through the existing penthouse will require removal and relocation of air handling equipment and distribution ductwork.

c. Construction of new Auditorium will require extensive renovation to systems and new systems to handle that space.

C. Second Level - Elevation 54'-10"

1. Equipment and ductwork presently located at Room 235 Balcony Apparatus Room #4 (elev. 61'-6") would be removed because level 61'-6" would be eliminated in new construction.

D. Main Level - Elevation 34'-10"

1. Existing Mechanical Equipment above Coat Room 176, (elev. 45'-0") will be removed along with all duct distribution and piping systems serving existing Administration areas and existing main entry areas. These areas will be demolished in the new construction and will become part of the expanded Exhibition Rooms at this level.

2. Existing Auditorium 154 and Stage 156 will be eliminated in the proposed new construction with a new floor being added that will eliminate the present balcony. A new Exhibition Hall will occupy this space and require removal of all existing systems serving the present Auditorium and Stage.

III. D. 2. cont'd.

Central units presently serving the existing space (located in the Mechanical Penthouse) would serve other areas or part of the new Exhibition Hall.

E. Lower Level - Elevation 10'-10"

This is new construction except Masss. Turnpike Ventilation Fan Room B02. Air supply inlets for Turnpike ventilation system will be relocated. Existing fans will be retained. This level will contain new mechanical space.

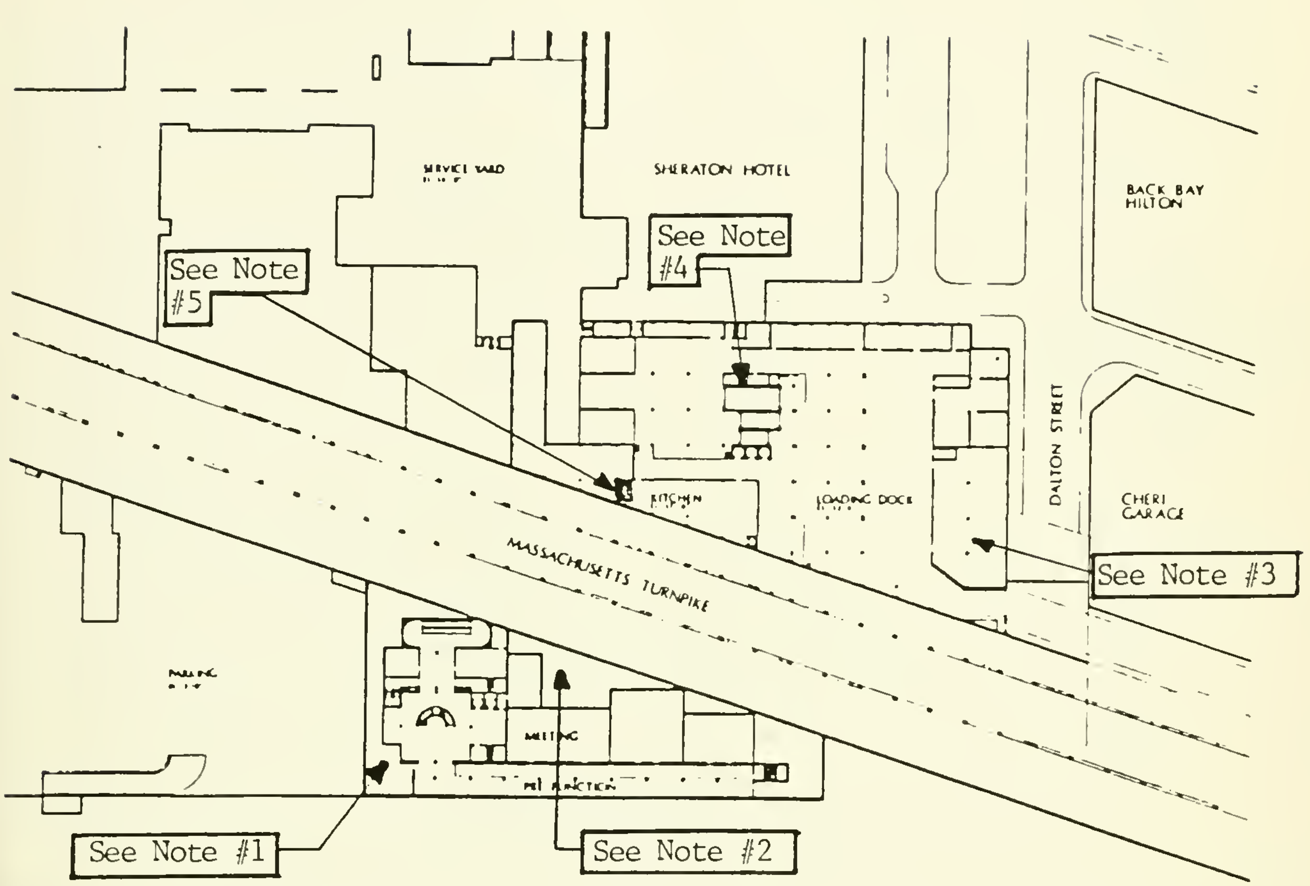
F. Basement Level 13'-0" and Kitchen Level 17'-0"

1. New construction in this area will require elimination of Basement Apparatus Room #3 located in Room B-31. Equipment in this space will be removed. Areas and systems that remain under the new construction served by this equipment will be handled by new system.
2. Basement Apparatus Room #1 will not be affected by new building construction umless adjacent electric rooms are increased in size to handle larger load. There will, however, be major mechanical work in this space because this room is being proposed as the location for new chillers and central pumping systmems. There will also be new plumbing equipment in this space.
3. Construction of new kitchen will require new HVAC system supply, exhaust and makeup air systems. Exhaust air will be routed through existing building to discharge at roof level.

G. Roof Level (various elevations):

1. New equipment at this level will include major air handling systems, cooling towers, exhaust systems, and emergency smoke removal system for Atrium.

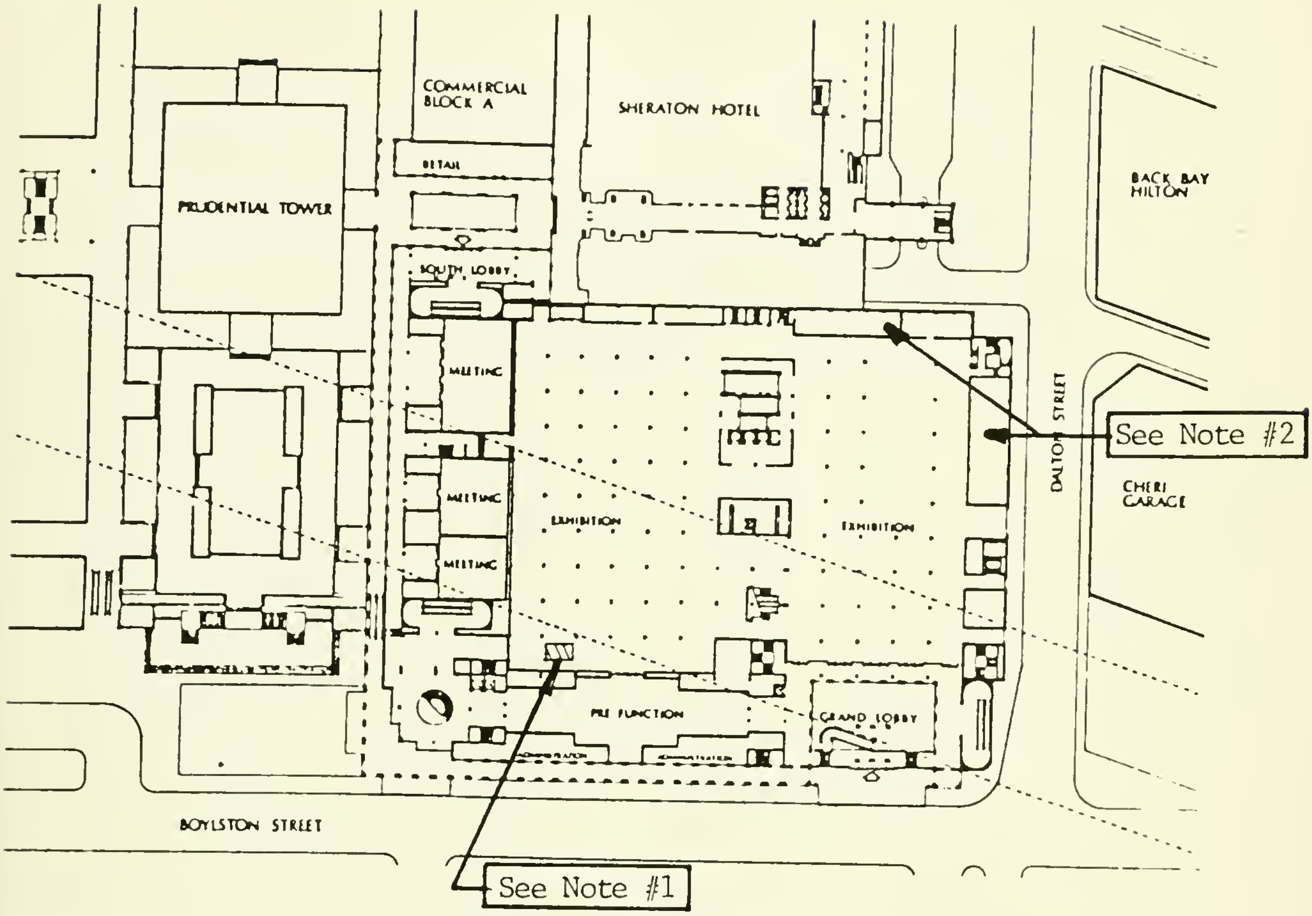
SK - HVAC - 4



Lower Level (Elevation 10'-10")
Basement Level (Elevation 13'-0")
Kitchen Level (Elevation 17'-0")

NOTES:

1. New Mechanical Equipment Room, See Paragraphs III. E. and V.B.1.a.
2. Existing Mass. Turnpike Fan Room to remain. Modifications to intake air.
3. Existing Basement Apparatus Rm. #1 to remain. Modifications to equipment.
4. Existing Basement Apparatus Rm. #2 to remain.
5. Existing Basement Apparatus Rm. #3 to be demolished.

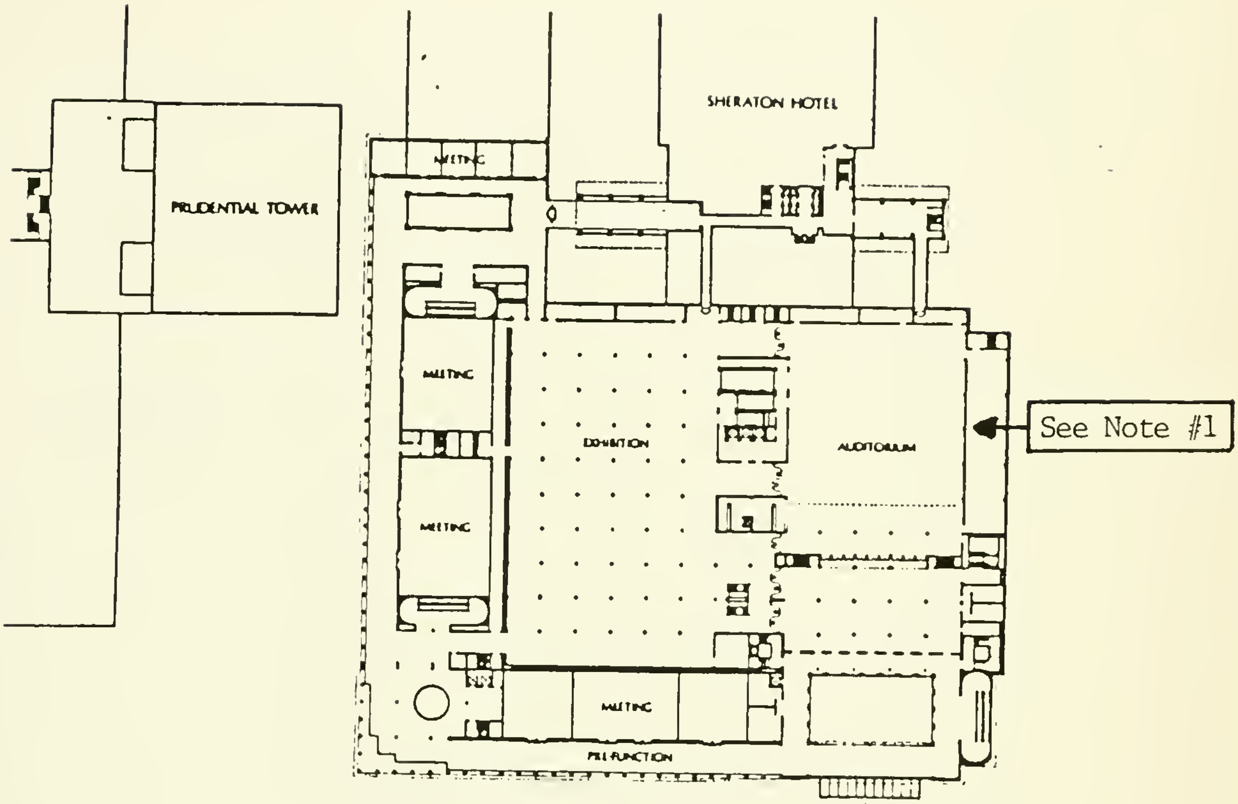


MAIN LEVEL - ELEVATION 34'-10"

NOTES: 1. Existing Mechanical Rm. above Coat Rm. #176 to be demolished. Refer to Paragraphs III. D.1. and V.D.

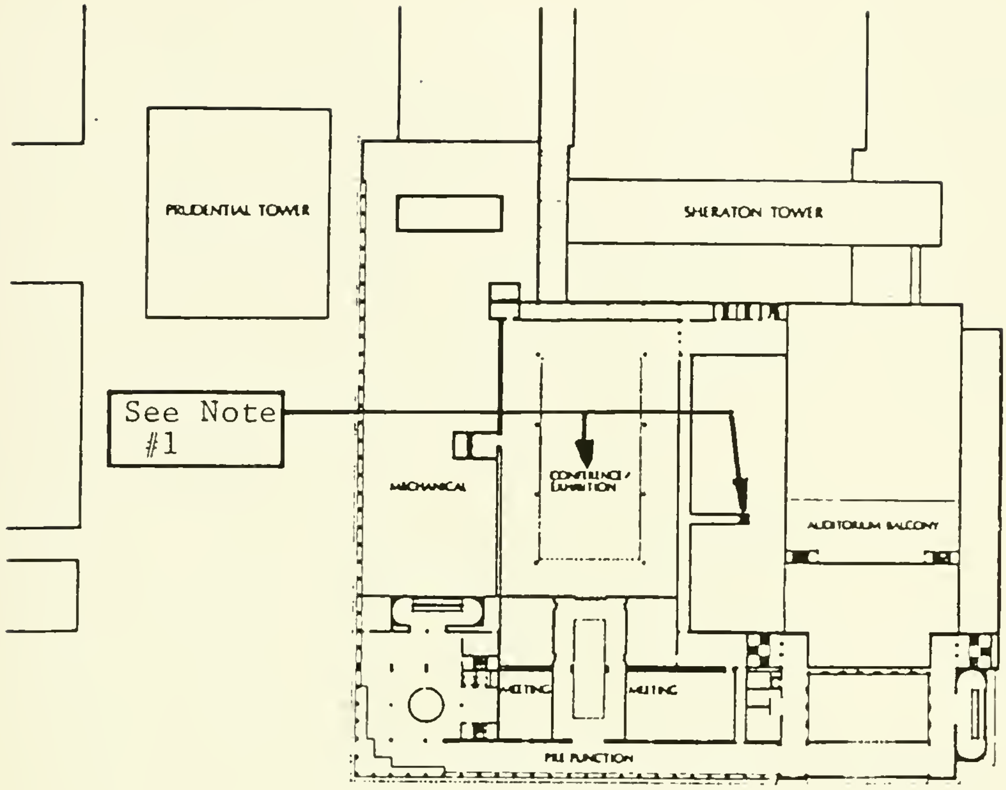
2. Refer to Paragraph III.D.2. for work in this area.

SK - HVAC - 6



SECOND LEVEL - ELEVATION 54'-10"

NOTES: 1. Refer to Paragraph III.C.1. and III.B.1.c.



THIRD LEVEL - ELEVATION 74'-10"

NOTES: 1. Refer to Paragraphs III.B., V.B., C. & D. for description of work at this level.

IV. OPTIONS AND RECOMMENDATIONS

A. General:

After reviewing the existing facility, proposed expansion and the required capacities to handle the new facilty, it is clear that further analysis will be required before a final system selection can be made. TMP Consulting Engineers, Inc. is presently preparing a proposal for an operating and first cost analysis of the various options listed below.

B. Options:

1. Fuel Source: Fuel sources available to this facility are Steam, Electric, Gas and Oil.
   a. Gas and oil are not prime candidates for this facility because of the seemingly insolvable problem of where to install the stack and how high it would be to avoid a major problem regarding emissions to the immediate surrounding Prudential and Sheraton Towers.
   b. Boston Edison Purchased Steam and Electric will be considered in the following categories:
      (1) All steam.
      (2) Steam Heating/Electric Cooling.
      (3) All Electric.
      (4) Advantages and disadvantages of these fuel sources must be considered using a thorough analysis of equipment first cost, reuse of existing equipment, operating and maintenance costs pertaining to both HVAC and electric systems.

IV. B. 1. b. (A) Methods of improving the efficiencies will be analyzed in terms of heat recovery and/or thermal storage. The impact that these systems can have on the rate structures will also be reviewed.

2. Systems:

The analyses of various systems in conjunction with different fuel sources will determine the most efficient HVAC system to install. The options for these systems to be studied will include:

a. Central Cooling Plant:

(1) Steam driven chillers.

(2) Electric chiller.

(3) Heat pump chillers.

(4) Ice storage (partial load).

(5) Thermal storage (partial load).

(6) Size:

Preliminary calculations indicate the new system will be in the 4000 - 4500 ton range based on the program requirements. The combination of sizes will depend on Owner furnished data regarding part loading and anticipated hours of use.

b. Central Heating Plant:

(1) Steam to hot water convertors.

(2) Electric hot water boilers.

(3) Hot water or steam or electric coils in various air handling systems.

(4) Capacity Requirements - Preliminary calculations indicate a total winter peak load of 6250 kw or equivalent steam at 23000 #/hr. which includes heating, preheat and reheat.

IV. B. 2. c. Ventilation:

(1) Central station custom built, high velocity, medium pressure, variable volume air handling systems.

(2) Outdoor Package Rooftop Variable Volume Air Handling System.

(3) Indoor Packaged Central Station Variable Volume Air Handling Units.

(4) Sizes and Capacities Required: Based on preliminary calculations shown in Table 6, Preliminary Air Handling Unit Capacity Requirements. Units will require 986,200 cfm. Standard competitive packaged equipment is normally 40000 cfm± capacity. This translates to 25 additional units plus ten that will probably be retained from existing systems. This is a total of 35 units, which will be a major maintenance concern. Built-up units can be made up to any air quantity and. therefore, number of units can be reduced. Further studies will determine number and sizes of units.

d. Air Distribution:

(1) High velocity air systems distributing air to variable volume terminal boxes. These terminal boxes will be the final point of temperature control.

e. Terminal heating equipment:

(1) Hot water fin tube radiation, cabinet unit heaters, and duct mounted coils.

(2) Electric baseboard; unit heaters and duct mounted coils.

(3) Combination of (1) and (2).

IV. B. 2. f. Controls:

(1) Pneumatic.

(2) Electric.

(3) Electronic.

(4) Central computerized monitoring and control system will be recommended regardless of which system is used.

C. Recommendations:

Final recommendations will be forthcoming after our system cost and operating cost analysis proposal is reviewed, accepted and completed.

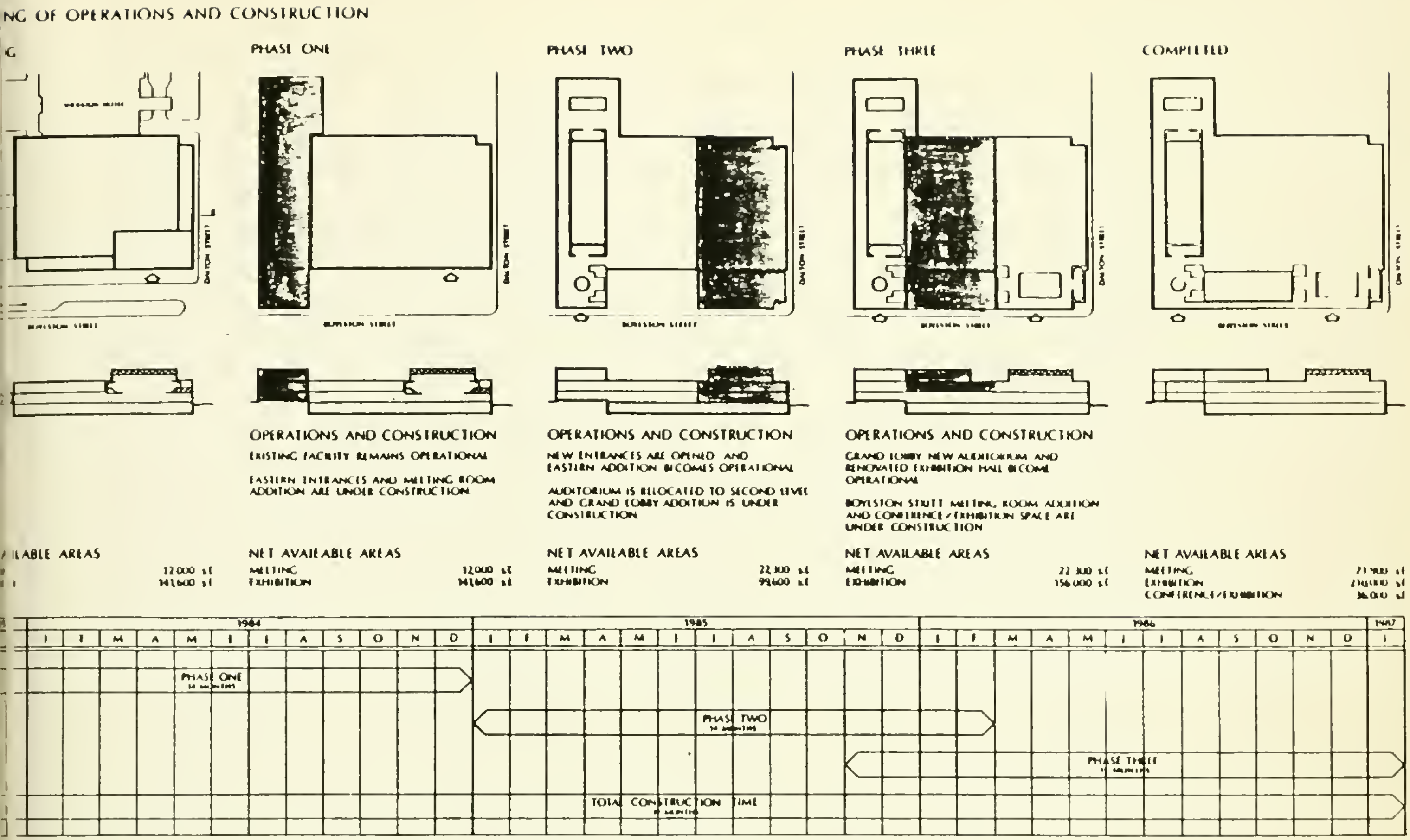
Our initial recommendations, based on prior experience in projects in this area and of the renovation/new addition type is that an all steam system is not a viable solution from an operating cost standpoint. Therefore, we anticipate either an all electric or an electric cooling/steam heating system with all steam converted to hot water for distribution to terminal equipment.

Air handling central systems should be built up type to reduce the number required and to increase life expectancy. Method of variable volume control and operating efficiencies at part loading is also a prime reason to use built up systems. This building type demands full flexibility in its air distribution and control system and this can be best arrived at via built up systems.

Local packaged units are recommended for areas with limited or constant use, such as administration, kitchen, and main maintenance areas. These systems should be totally independent so as not to require operation of large central equipment at inefficient low load conditions. Control of most areas will be independent even though supplied via large central systems.

IV. C. cont'd.

Area terminal boxes will have ability to shut off when space is not in use and will reduce loading on central systems accordingly. All heating systems will have occupied/unoccupied and night setback capabilities to reduce temperatures during inactive periods. Central source of controls for all systems from control console will greatly enhance the system flexibility and allow minimum operating personnel to control temperatures and on/off status of equipment.



V. PHASING

A. General:

Construction will begin in November, 1983 and be completed in January, 1987. Work is divided into three major phases. Hynes must continue to operate throughout entire construction with only reduction in exhibit space during Phase II.

V. B. Phase One:

1. Phase One construction will add 156000 square feet and will contain major areas designated for mechanical equipment. This phase involves reconstruction of Commercial Block "C" into a two-story lobby/meeting room area and will extend from November, 1983 to December, 1984.

   a. If an all electric system is decided on, the Central Heating Plant will be located in the basement area of Phase One new construction because of electrical power feed restrictions. If a steam heating system is the final choice, the main heating convertors will be either in Phase One basement level 10'-10" or in Existing Basement Apparatus Room #1. The existing room will be available for work during all phases of construction and, therefore, provides maximum flexibility. The entire central plant heating system and associated pumping and piping system mains can be installed. Distribution for Phase One construction will be installed with piping capped for future connections under other phases.

V. B. 1. b. Penthouse mechanical room at upper level of Phase One construction will house air handling units to serve Phase One construction and also adjacent phases. Duct distribution systems serving other phases will be capped for future connection.

c. Additional cooling capacity required for Phase One will be handled by new chillers installed in existing Basement Apparatus Room #1. All chillers can be installed immediately or staggered to meet load with the main piping and pumping installed in increments as the new load increases and is transferred from existing equipment to new equipment.

(1) Installation of chillers will require relocation of main steam piping to a higher elevation in mechanical room. This relocation will be either temporary or permanent, depending on the final system chosen.

d. Existing cooling towers, and steam heating will be maintained during this phase.

e. The most complex portion of mechanical phasing occurs in this phase, providing of enough cooling tower capacity to handle new load of Phase One. New cooling towers are scheduled under Phase Two and, therefore, a gap in capacity will exist. One solution of this would be to temporarily install the required additional amount. It would then be relocated under Phase Two when the final cooling tower system will be installed complete.

V. B. 1. e. cont'd.

Another solution would be to alter the phasing schedule slightly so that an overlap occured between Phase One and Two where a tower could be installed prior to occupancy of Phase One in its final location.

C. Phase Two:

1. This phase includes closing down of the first floor auditorium so that a new floor and lobby can be constructed. This phase will occur from January, 1985 to February, 1986 and will add 72000 square feet to the facility.

2. Mechanical work in this phase includes:

   a. Demolition of HVAC systems serving existing Auditorium.

   b. Air handling units to handle Phase Two construction in new Mechanical Room bordering Dalton Street side of building.

   c. Installation of new Cooling Towers.

   d. Installation of final chiller equipment for full load.

   e. Renovations to air handling systems & equipment serving areas disturbed in Phase Two.

D. Phase Three:

1. This phase includes building a new third floor Meeting/ Exhibit space and completing construction in the Ring Road in front of the Hynes. This phase overlaps Phase Two and occurs from November, 1985 to December , 1986 and adds 146000 square feet.

V. D. Phase Three:

2. Mechanical work included in Phase Three is as follows:
   a. Installation of new air handling equipment in new Penthouse Mechanical Equipment Room above new Meeting Rooms.
   b. Relocation of fresh air intakes for existing Mechanical Penthouse.
   c. Renovations to air handling units (in existing Penthouse) serving areas disturbed by Phase Three.
   d. Final disconnection and removal of all existing systems not remaining.
   e. Connection to air and water systems left capped under previous phases.

E. Miscellaneous:

1. Renovation to duct systems and replacements of terminal box equipment will be done during all phases of construction as access is permitted to various areas.

Plumbing

1. Existing Conditions & Development

Robert W. Sullivan, Inc.

HYNES AUDITORIUM EXPANSION

PLUMBING AND FIRE PROTECTION

VOLUME I (SUMMARY MATERIAL)

I. EXISTING CONDITIONS AND DEVELOPMENT

INDEX

A. SUMMARY

- The Plumbing and Fire Protection System for the new expansion and renovation of the Hynes Auditorium will be designed according to the latest State Building Codes, State Plumbing Code, National Fire Protection Association Regulation and Local Authorities requirement.

- Three hydrant flow tests were conducted on Boylston and Dalton Streets, two on the Low Service and one on the High Service. The results indicate an adequate water supply for both domestic and fire protection purposes but not adequate pressure.

- It appears that the existing utilities serving the building: domestic cold water services, fire protection services, sanitary sewers, storm drainage and natural gas are adequate for the new expansion. This will be determined in the next Phase.

B. EXISTING SYSTEMS

1. Work Performed

The following are the work performed and the sources of information which were researched to find out the existing systems and their conditions:

. Reviewed existing drawings and available data received from the Architect and in Robert W. Sullivan, Inc. files.

. Verified information including locations, sizes, inverts, and slopes of existing utilities serving the building and in the surrounding streets at the Boston Water and Sewer Commission.

. Inspected outside sanitary sewer and storm systems, submitted a proposal for the sewer monitoring survey with a sketch showing location of manholes to be monitored and period of monitoring. The Public Facility Department deferred the Sewer Monitoring Survey to the Second Phase.

. Three hydrant flow tests were conducted and a report was submitted with a sketch showing the locations of Fire Hydrants.

. Visited the existing building and inspected the Plumbing and Fire Protection Systems and Equipment.

2. Existing Systems

The following is the Description of Existing Systems and their conditions:

. Plumbing Fixtures

Existing plumbing fixtures and fittings in toilet rooms and concession preparation areas are manufactured by Kohler Company, approximately twenty years old, and in good condition except the following:

- One lavatory is cracked in toilet at Basement Trucking Area.
- One water closet was removed and replaced by a shower in toilet at Basement Mechanical Room.
- Some lavatory faucets are leaking.
- Some water closets and urinal flush valves are not working properly.
- Some lavatory soap dispensers are missing and some are not working. (Soap Dispensing is a Centenal System).
- Some chains and plugs are missing from lavatories.

- One water closet, one urinal, one lavatory in mens toilet room, and one water closet, one lavatory in womens toilet room at the first floor were changed to be handicap fixtures but the lavatories were not roughed according to the Massachusetts Plumbing Code and the Architectural Barriers Board Regulations.

- Some brackets are missing from Service Sinks Faucets.

- All hose bibbs in toilet rooms do not conform with the latest Massachusetts Plumbing Code and Department of Environmental Quality Engineering Regulations.

. Soil, Waste, Vent, and Conductor Piping

Soil, waste, and conductor piping is galvanized wrought iron with drainage pattern fittings. Vent piping is galvanized steel with cast iron fittings. All piping and fittings are in good condition except urinal wastes are patched for leaking.

. Water Piping

Cold water, hot water, hot water circulating, and drinking water piping is hard temper copper tubing with bronze fittings. Cold water, hot water, and hot water circulating piping is insulated with ½-inch thick fiberglass insulation and standard canvas finish. Drinking water piping is insulated with 1½-inch thick fiberglass insulation and factory, applied vapor seal barrier. All piping and fittings are in good condition.

. Compressed Air Piping

Compressed air piping is American Standard weight Schedule 40 galvanized steel with standard galvanized malleable fittings. All piping and fittings are in good condition.

. Natural Gas Piping

Natural gas piping is American Standard weight Schedule 40 black steel with Standard malleable iron fittings. All piping and fittings are in good condition.

3. Existing Equipment

The following equipment exists in the lower level. For exact location, refer to attached drawing for existing basement floor plan:

. Domestic Hot Water Heaters

The domestic hot water heaters consist of two 865 gallon capacity hot

water storage heaters manufactured by Patterson-Kelley Company with internal heating elements through which all condensate from the steam heating system flows until the water in the tank is heated to 180°F; at this point the condensate is by-passed directly to the condensate meters. The water from these two storage tanks flows through an instantaneous heater having a capacity of 3,000 GPH heated from 40° to 140°F manufactured by Patterson-Kelley Company which raises the water temperature only if it is below 140°F, discharge from the instantaneous heater flows through a thermostatic mixing valve which delivers water at a temperature of 140°F to the hot water piping system. Duplex hot water circulating pumps having a capacity 50 GPM against a 35' head with 1 HP motor manufactured by Bell and Gossett Company circulate the hot water throughout the hot water piping system and back through the instantaneous water heater and temperature mixing valve with valving arrangement provided for circulating through the storage tanks or by-passing them according to hot water demand in the building. All equipment and accessories are in good condition except the steam connection to the instantaneous water heater is leaking, the condensate trap had deteriorated.

. Drinking Water Cooling Units

Four complete packaged type drinking water cooling units manufactured by Filtrine Company. Two units having a storage 100 gallon and capacity to cool 115 GPH from 80°F to 45°F with condensing unit motor 3 HP for each, and two units having a storage 120 gallons and capacity to cool 180 GPH from 80°F to 45°F with condensing unit motor 5 HP for each. Each unit is complete with all bronze circulating pumps having capacity of 20 GPM at 97' head and 1 HP motor manufactured by Ingersoll Rand Company, and duplex filter - Purifier having a capacity of 8 GPM. The drinking water cooling units are in good condition except the circulating pumps and filters - purifiers are in bad condition.

. Duplex Sewage Ejector

Duplex sewage ejector having each pump rated at 150 GPM against a 30' head with 3 HP motor manufactured by Weil Company. Duplex sewage ejector is complete with 48" diameter by 12'0" deep cast iron basin, 54" diameter by ½" thick coverplate and NEMA IV enclosed, pedestal-mounted float switch with complete float rig. The duplex sewage ejector is in good condition except the high water alarm is not wired.

. Condensate Receiver

Condensate receiver is 42" diameter by 10'0" deep cast iron with 46" diameter by ½" thick coverplate and it is in good condition.

. Gasoline and Oil Interceptor

Gasoline and oil interceptor is 42" diameter by 120" deep cast iron with 46" diameter by ½" thick coverplate and it is in good condition.

. Air Compressors

Two horizontal, water cooled, motor driven air compressors manufactured by Pennsylvania Company. Each compressor is driven through guarded, multi V-belts by a 40 HP, and provided with combination filter-silencer manufactured by Dollinger Company. Two air receivers 30" diameter by 7'0" long vertical type. Air compressors and accessories are in good condition.

4. Reduced Pressure Backflow Preventers

Six reduced pressure backflow preventers exist and were installed in 1974, for exact location refer to attached drawings for existing building.

5. Utility Floor Boxes

Utility floor boxes exist in all exhibition areas in first and second floors, for exact location, refer to attached first and second floor plans. Utility floor boxes are indicated on the floor plans in three types "S", "G", and "B". All floor boxes are provided with 3-inch waste connection, 3/4-inch drain, 1-inch cold water connection, and 3/4-inch compressed air connection. Floor boxes indicated as "S" had 1¼ steam connection which is disconnected and 1¼ gas capped under the box for future. Floor boxes indicated as "G" are provided with 1¼-inch gas connection. Renovation of these utility floor boxes were completed last December.

6. Fire Protection System

The fire protection system provided consists of the following:

. First Air Fire Hose Stations, Fire Department Standpipes with hose end valves for fire department use and First Aid Fire Extinguishers. All fire lines and standpipes are black steel pipe and fittings.

. Sprinkler system exists in all Lower Level, Storage Rooms, Mechanical Rooms, and the Stage.

7. Utilities

The following are the existing utilities serving the building, for exact location, refer to attached drawings for existing building.

. Domestic Cold Water Services

The building is served by two 6-inches domestic cold water services connected to the low water service mains one in Boylston Street and ano-

ther in Dalton Street.

. Fire Protection Services

The building is served by two 8-inches fire protection services connected to high water service mains, one in Boylston Street and another in Dalton Street.

. Sanitary Sewers

The sanitary sewers from the building collect and discharge to main sewers in the street, two 8-inches to Boylston and one 10-inches to Dalton Street.

. Storm Drainage

The drainage piping collect surface water and building conductors and discharges to storm drains in the street, one 8-inch and one 15-inch to Boylston Street, one 12-inch and one 15-inch to Dalton Street.

. Natural Gas

The building is served by one 6-inch natural gas service connected to the gas main in Dalton Street.

C. <u>PROPOSED EXPANSION</u>

1. The following existing systems are not adequate for the new expansion:

. Water pressure in domestic water system.

. Domestic hot water system.

. Drinking water cooling system.

. Sanitary sewer system in Basement Expansion.

. Compressed air system.

. Water pressure in fire protection system.

. Sprinkler system.

D. OPTIONS AND RECOMMENDATIONS

1. Existing Systems

The following are our recommendations to maintain the existing systems:

. Plumbing Fixtures

- Replace cracked lavatory in toilet at Basement Trucking Area.
- Install removed Water Closet in Toilet at Basement Mechanical Room and install new showers in new toilet rooms in the Basement Expansion.
- Replace all lavatory faucets.
- Replace all flush valves for water closets and urinals.
- Replace missing Soap Dispensers and repair non-working ones for lavatories.
- Replace missing chains and plugs for lavatories.
- Replace missing brackets for Service Sinks.
- Replace all hose bibbs in toilet rooms with new approved ones with Vacuum Breakers.
- Provide Handicapped Toilets as required by Massachusetts Plumbing Code and Architectural Barriers Board Regulations.

. Soil, Waste, and Vent Piping

Replace all urinal waste piping with new cast iron piping.

. Water Piping

Replace all domestic hot water piping insulation with 1-inch thick insulation as required by Massachsuetts Plumbing Code.

2. Existing Equipment

The following are our recommendations to maintain the existing equipment:

. Domestic Hot Water Heaters

- Replace existing leaking steam connection to domestic hot water heaters, piping, fittings, and condensate trap.
- Existing domestic hot water storage heaters by steam can be converted

to be heated by electric if it is decided to disconnect the steam service.

. Drinking Water Cooling Units

- Replace all circulating pumps in the four units.
- Replace all filters-purifiers in the four units.

. Duplex Sewage Ejector

Wire the high water alarm for the duplex sewage ejector.

. Fire Protection Sprinkler System is required in all floors throughout the existing building by the State Building Code.

3. Additional Investigations

The following are our recommendations for additional investigations:

. Conduct the Sewer Monitoring Survey to determine the necessity of sewage holding tanks and pumps.

4. New Expansion

The following are our recommendations for the new expansion:

. New Domestic Water Pumps are required to maintain adequate pressure on the upper floors to be located in the Lower Level Mechanical Room.

. New Domestic Hot Water Heaters and Circulating Pumps for the new expansion and main production kitchen to be located in the Lower Level Mechanical Room.

. New Drinking Water Cooling Units with Circulating Pump are required for the new drinking fountains in the new expansion.

. New Duplex Sewage Ejector is required for the new basement expansion to be located in the new basement at Boylston Street.

. New Air Compressors and Air Receivers for the additional utility floor boxes are required. We recommend installing small units because in most shows compressed air is only required in few areas and running the existing 40 HP unit to serve them is very costly to operate.

. Additional Utility Floor Boxes are required in the expanded exhibition areas.

- New Fire Protection Standpipe with hose end valves for fire department use, first aid fire hose stations, and first aid fire extinguishers in the new expansion.

- New Fire Protection Sprinkler System is required in all floors throughout all the new expansion.

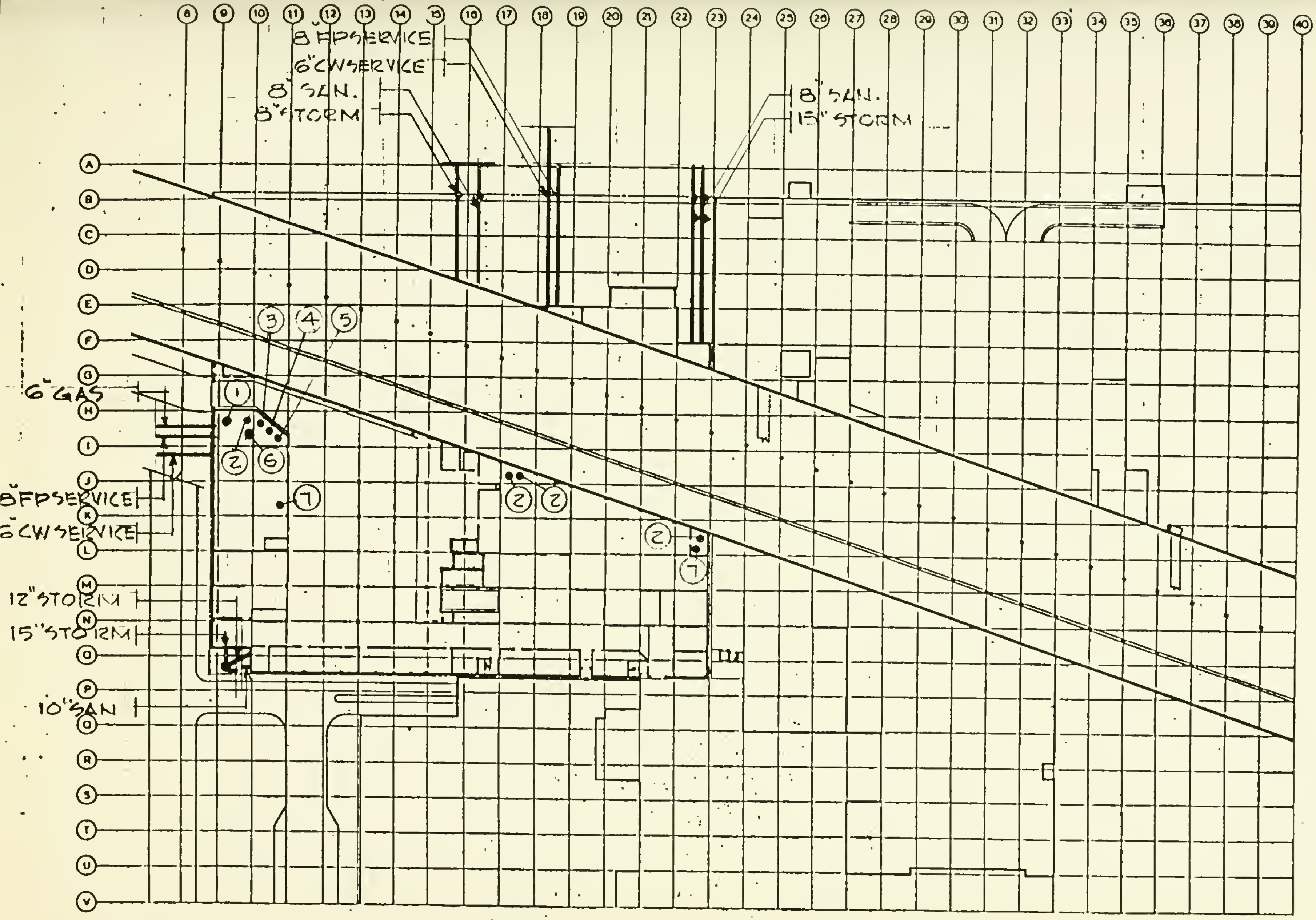
- New Fire Pump is required to maintain the required water pressure in the fire protection system to be located in the Lower Level Mechanical Room.

5. Options

As an option to the new drinking water cooling units, electric water coolers can be used.

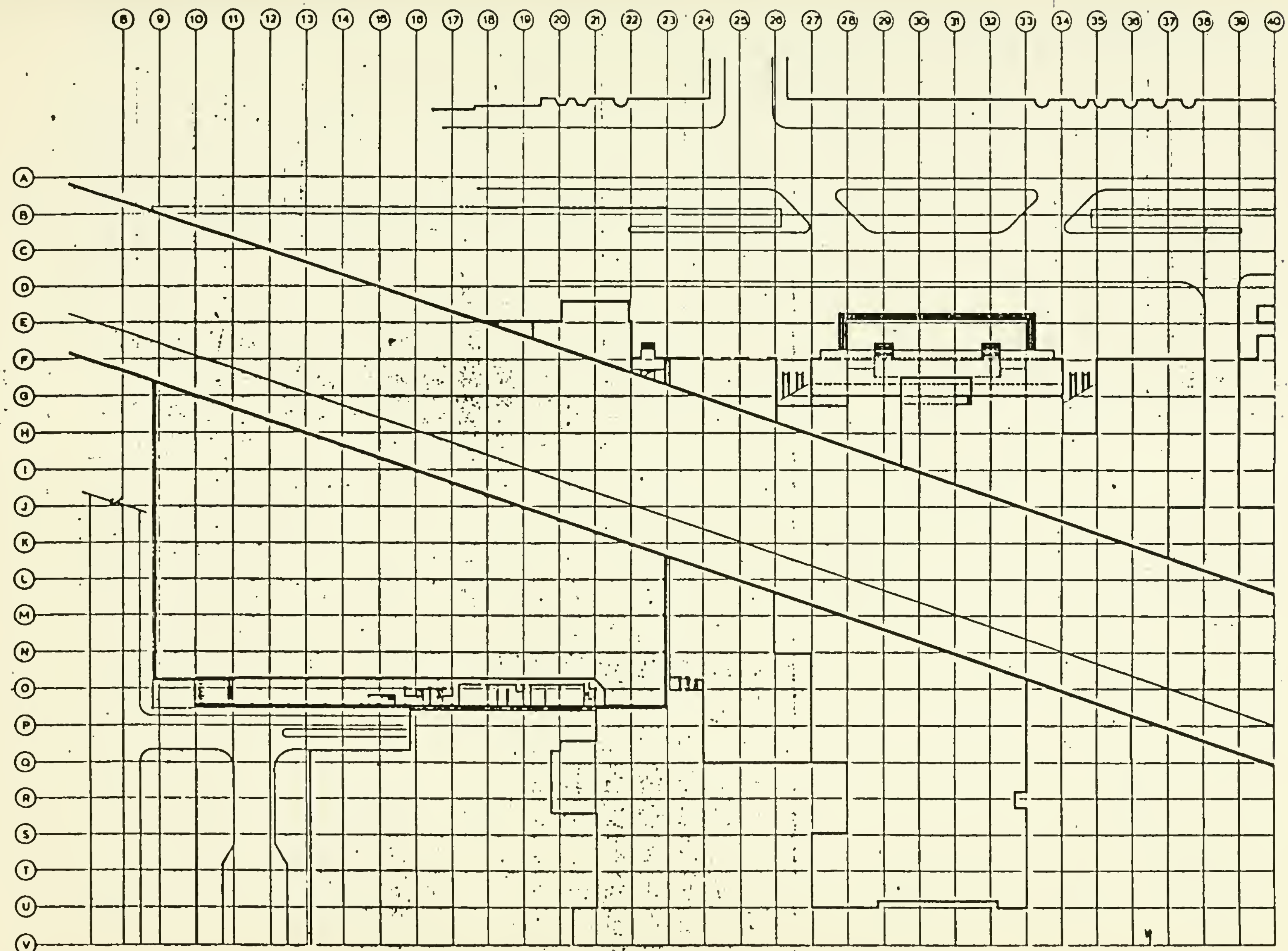
E. PHASING

In order that the existing Auditorium remains operational, it is understood that the proposed expansion and renovation will be completed in three phases. However, once construction begins, it is recommended that all new equipment and main piping for all systems to be installed in Phase I with valved, capped, and plugged connections for connecting the services to Phase II and Phase III when completed to minimize the interruptions of existing services.

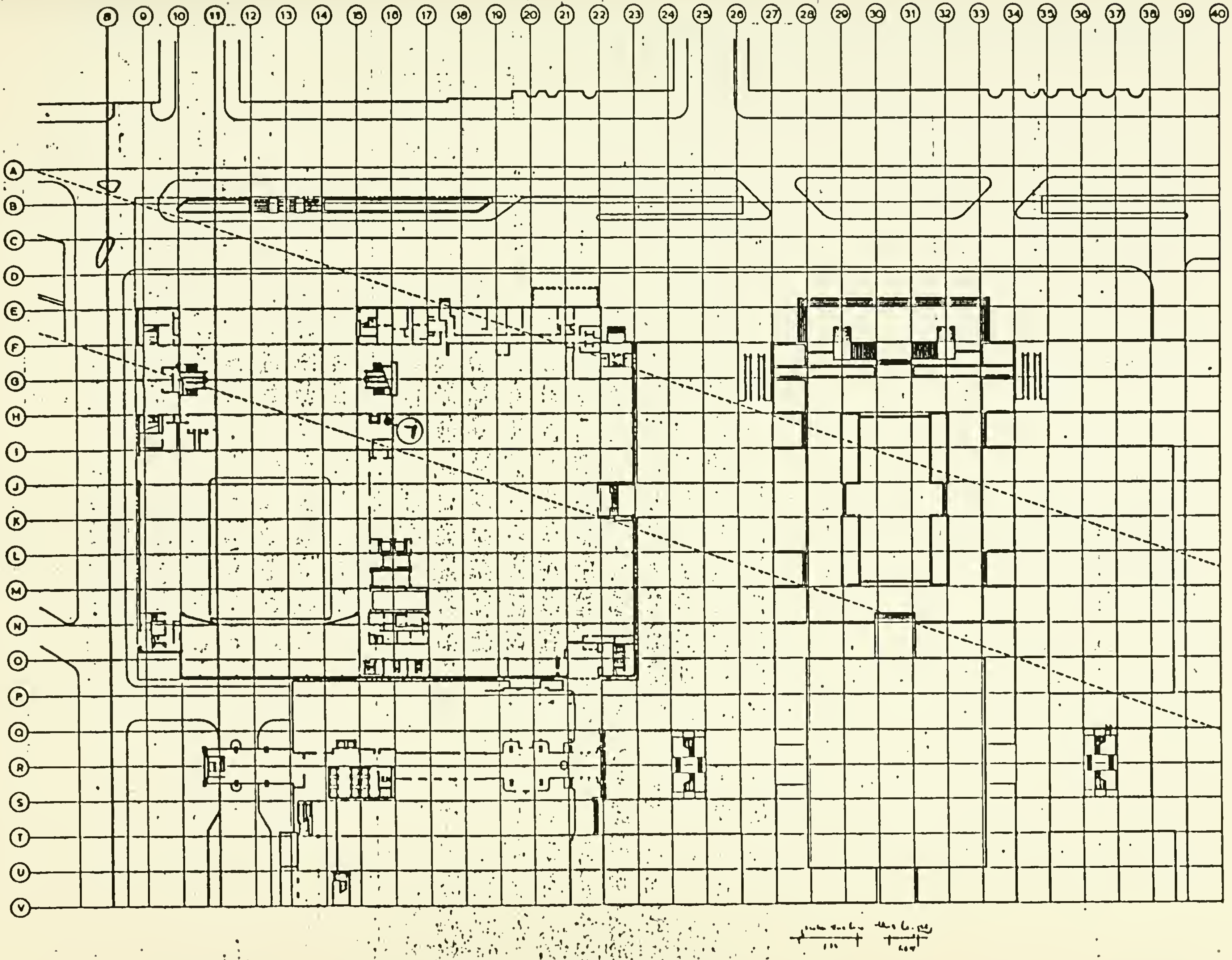


1. DOMESTIC HOT WATER HEATERS
2. DRINKING WATER COOLING UNIT
3. DUPLEX. SEWAGE EJECTOR
4. CONDENSATE RECEIVER
5. GASOLINE AND OIL INTERCEPTOR
6. AIR COMPRESSORS
7. REDUCED PRESSURE BACKFLOW PREVENTER.

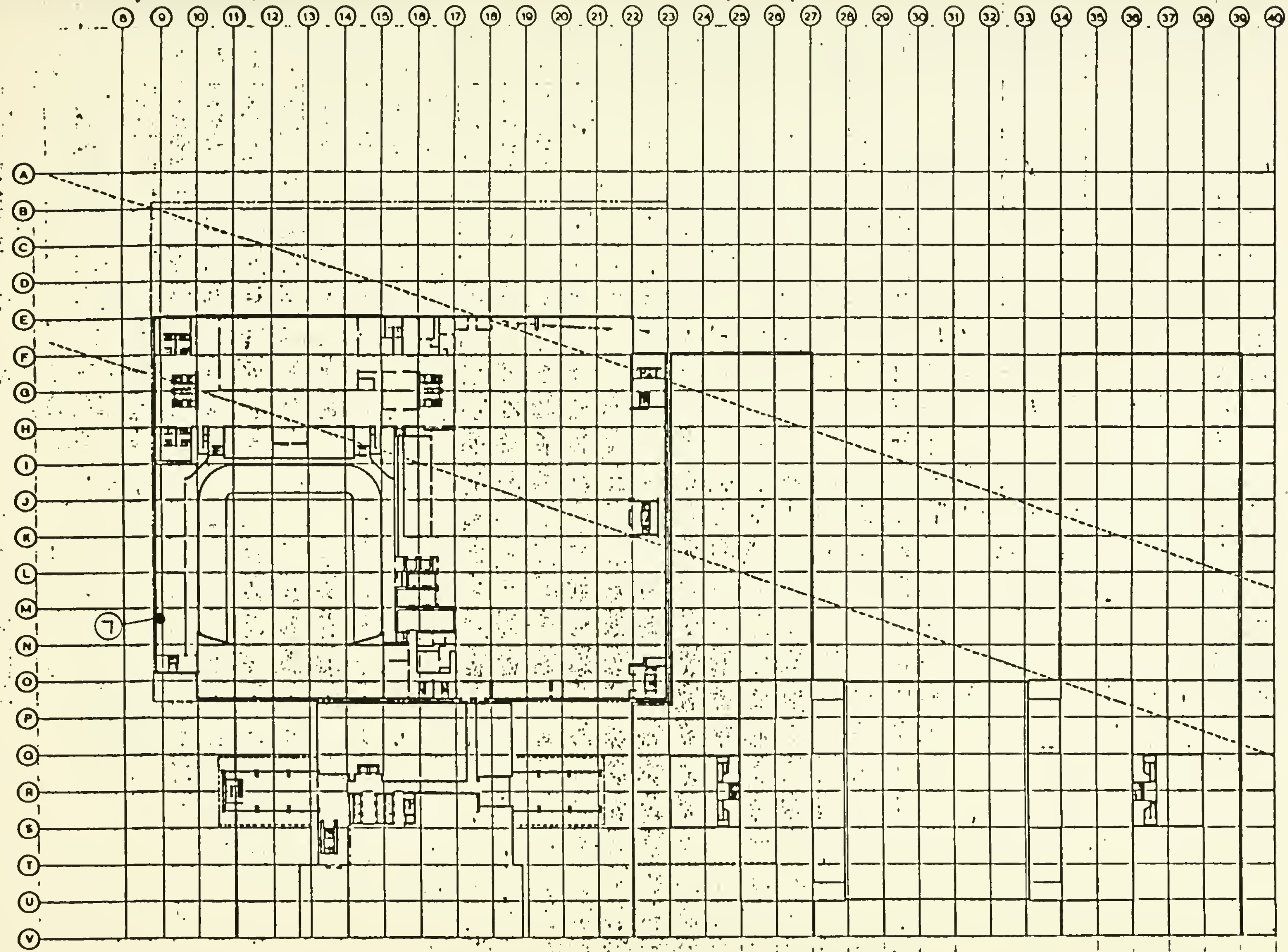
EXISTING BASEMENT FLOOR PLAN EL. 13'-0"



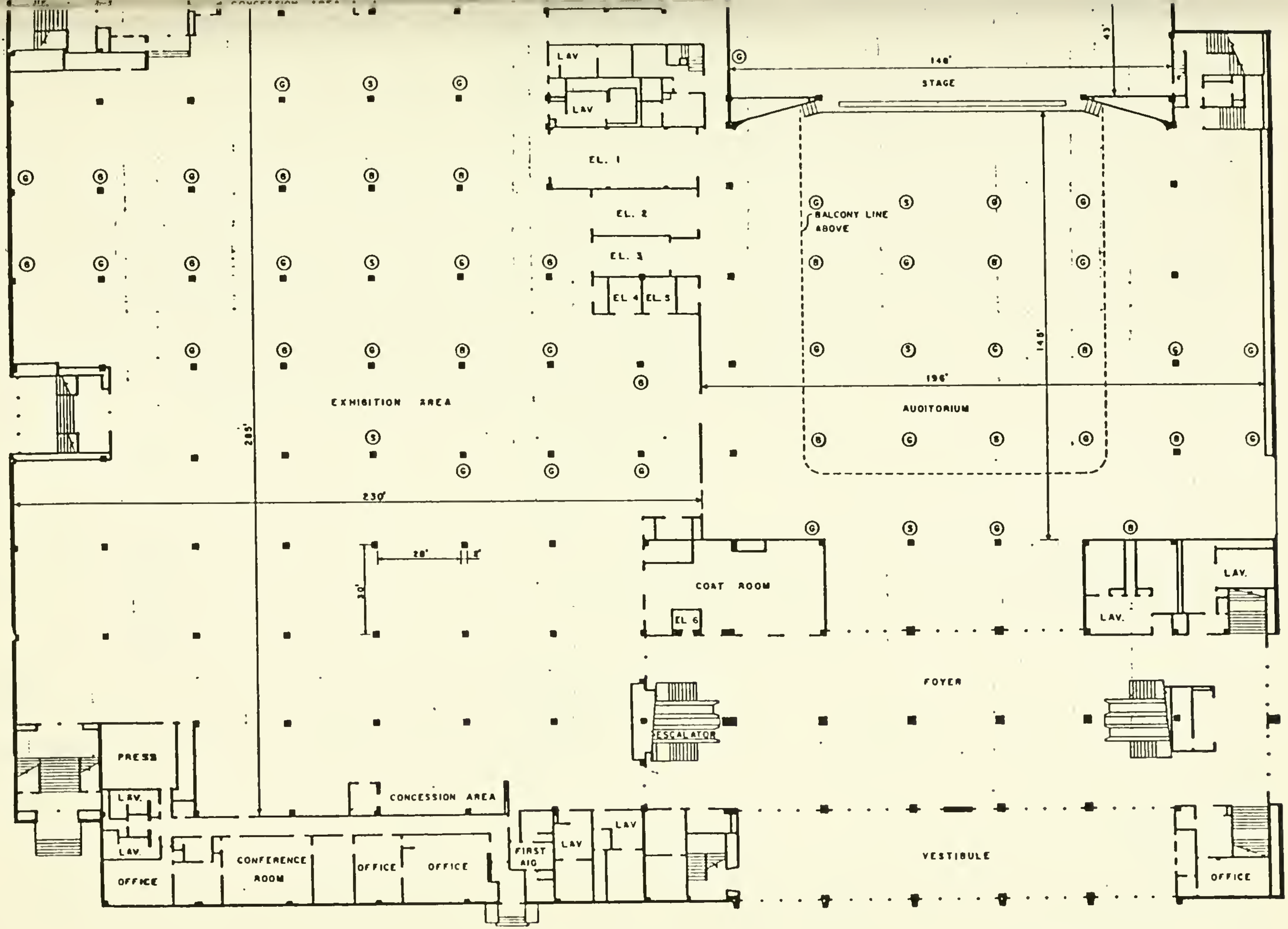
EXISTING MEZZ. FL PLAN EL. 25'-5½"



EXISTING: 1ST. FLOOR PLAN EL 34'10"



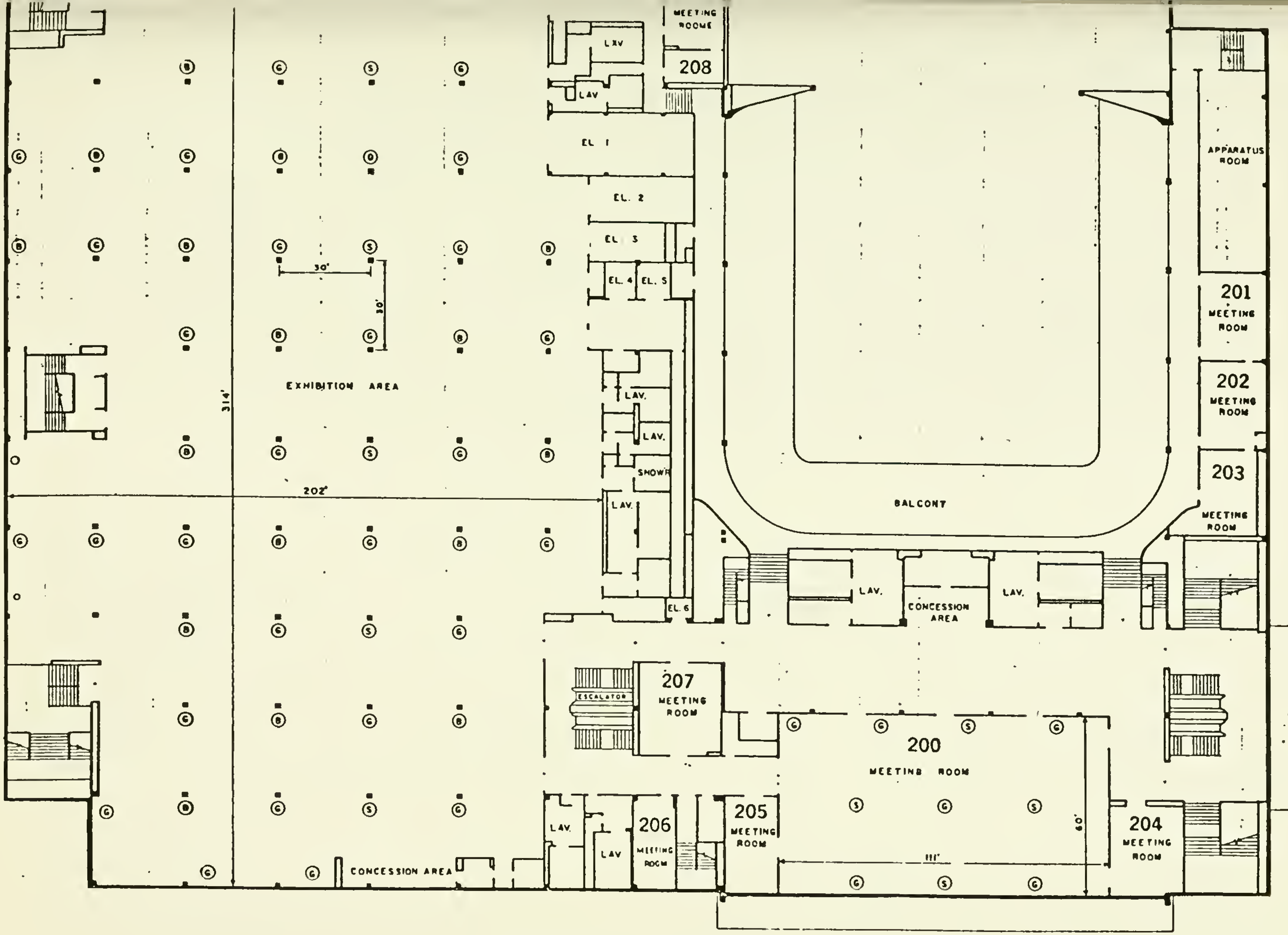
EXISTING 2ND FL PLAN EL 54'-10"



FIRST FLOOR PLAN
WAR MEMORIAL AUDITORIUM

Overall dimensions: 426' x 315'
Exhibition and concession area: 230' x 285'
Ceiling height: 14' 3"
Stage: 148' x 42' — stage tower is 85' high
Auditorium area: 196' x 145' — ceiling height: 50'
Floor Box "S" 3-inch waste (1¼-inch steam-capped gas)
1-inch cold water
¾-inch compressed air
Floor Box "G" 3-inch waste (1¼-inch gas)
1-inch cold water
¾-inch compressed air

Floor Box "B" 3-inch waste
1-inch cold water
¾-inch compressed air
Current characteristics: 120V to 208V, 3-phase, 4-wire
Available as: 120V, single phase, 60 cycles
208V, single phase, 60 cycles
208V, 3-phase, 60 cycles
440V current can be supplied as a special installation.
Telephone Jacks are located at each column.
Electric current is available from overhead bus ducts.



SECOND FLOOR PLAN
AR MEMORIAL AUDITORIUM

Overall dimensions, 426' x 315'
Exhibition and concession area: 202' x 314'
Ceiling height: 14' 3"
Floor Box "S" 3-inch waste (1¼-inch steam-capped gas)
1-inch cold water
¾-inch compressed air
Floor Box "G" 3-inch waste (1½-inch gas)
1-inch cold water
¾-inch compressed air

Floor Box "B" 3-inch waste
1-inch cold water
¾-inch compressed air
Current characteristics: 120V to 208V, 3-phase, 4-wire
Available as: 120V, single phase, 60 cycles
208V, single phase, 60 cycles
208V, 3-phase, 60 cycles
440V current can be supplied as a special installation.
Telephone jacks are located at each column.
Electric current is available from overhead bus ducts.

Electrical

1. Existing Conditions & Development

Lottero & Mason Associates Inc.

HYNES AUDITORIUM EXPANSION

ELECTRICAL

INDEX

Summary:

Based on our analysis of the present electrical systems of the existing facility, the anticipated load increases associated with the conversion of existing steam to electric heating or a combination of existing steam heating and new electric cooling, and the general overall low tension system requirements of the expansion program, the facility will be best served by electrical system modifications and additions as hereinafter described. The underlying intention is to maintain as much of the existing electrical system installation as possible. Where it can be ascertained, through testing and evaluation procedures, that existing equipment is useful with minor repair or modification, our recommendation is to maintain this equipment in place. This approach is contingent upon the degree of repair or modification, the resulting life expectancy, and the cost effectiveness of repair over replacement.

In summary, it is our opinion the electrical system installation in accordance with the expansion construction program needs and the proposed phasing program can be progressively accomplished to serve the existing facility during the expansion program and ultimately the new Convention Center.

B. Existing Systems:

1. The following overview of existing systems of the Hynes Auditorium has been prepared from a review and examination of the original contract electrical drawings and specifications dated January 8, 1962, site research and visual inspections of systems discussed, consultations with HVAC, Plumbing and Fire Protection engineering disciplines involved with the project, and conferences with Boston Edison Co. personnel, New England Telephone Co. personnel, and the Boston Fire Department Superintendent of Alarms. Documentation of the various discussions is included in Volume II of this report. Site inspection efforts included visual observation of all existing systems hereinafter discussed and consultations with maintenance/electrical and supervisory personnel. Conclusions drawn are based on the opinions and experience of Auditorium personnel consulted and our best engineering judgements.

2. Main Electric Service:

The main electric service consists of a Boston Edison Co. 13,800 volt, 3 phase underground primary service installed to a basement (lower level) transformer vault located on the Dalton Street side of the existing Auditorium. Four 1,000 KVA, 13,800 to 277/480 volt, 3 phase, 4 wire transformers are contained within the existing vault and are owned and maintained by Boston Edison Co.

A 3,000 ampere secondary collector bus within vault receives and delivers 277/480 volt, 3 phase, 4 wire secondary service to lighting and power sections of main secondary switchgear (located in adjacent main electric switchgear room) which in turn feed a double ended load center for exhibition power and lighting, a load center for Auditorium lighting, a load center for stage lighting, an emergency distribution system switchboard, motor control centers, and distribution panels and equipment throughout the facility. The locations of existing transformer vault and main electric switchgear room are shown on lower level basement plan, Drawing E-1.

3. EMERGENCY GENERATOR AND DISTRIBUTION SYSTEM:

A standby 250 KVA (200 KW) 120/208 volt, 3 phase, 4 wire diesel engine driven emergency generator is located in a separate room adjacent to the main electric switchgear room. The associated emergency generator switchboard, located in the main electric switchgear room, includes feeder circuit breakers, transfer switches, 208 volt and 480 volt, 3 phase contactors, and 112.5 KVA, 208/480 volt, 3 phase transformation which provides appropriate high and low voltages to suit existing emergency equipment requirements.

The operation of the existing emergency generator system is such, that in the event of a service failure, equipment such as specific HVAC system duplex condensate pumps and chilled water pumps, communication systems, and emergency lighting in all egress and public areas, auditorium, exhibition halls and meeting rooms is transferred, through a series of transfer switches and contactors, to the emergency generator. Upon restoration and stabilization of normal power, a retransfer from emergency to normal building service is completed. Refer to Drawing E1, lower level basement plan for location of existing emergency generator room.

4. Exhibition Area Power:

Exhibit power is distributed via bus ducts throughout the exhibition area. The bus ducts are suspended from the ceiling and by means of plug-in flusible disconnect switches, power is delivered down to the exhibit floor by flexible cable to temporary panelboards. It appears that the flexible cable drops are generally installed on the columns and cables are installed on the floor behind exhibit displays. Voltage available to exhibitors is generally 120/208 volts, 3 phase, 4 wire; however, occasionally 277/480 volt, 3 phase, 4 wire power is required and is provided from vertical bus duct risers located in existing electric closets.

5. Meeting Room Power:

In meeting rooms, a receptacle and telephone floor box system is installed on a modular arrangement with similar provisions on perimeter walls including heavy duty three phase receptacles to serve exhibit needs. These provisions, though ostensibly minimal, appear to satisfy the present space needs. Receptacles provide both 120 volt, single phase and 208 volt, 3 phase power to exhibitors. 480 volt power, when required, is brought in separately from electric closet bus duct risers similar to exhibition hall provisions.

6. Telephone System:

The New England Telephone service enters the building in the existing main electric switchgear room via four 4-inch underground service conduits. These conduits are extended to the adjacent main telephone equipment room and terminated on the wall above telephone frame equipment. From this room a multitude of 2, 3 and 4-inch conduits are distributed throughout the facility to various telephone closets, junction boxes, multi-jack cabinets and main switchboard equipment room on the second floor. Refer to Drawing E1 for location of existing main telephone equipment room.

Telephone jacks and minimal outlets are located in offices, conference rooms, meeting rooms, auditorium, and perimeter walls of exhibition area. Exhibitor needs are provided via multi-jack cabinets (8 jacks per cabinet) located on columns throughout the exhibition area from which flexible cables are extended to exhibit displays.

7. Lighting:

The general lighting throughout the existing facility is fluorescent, supplemented in most areas with incandescent. The fluorescent type fixtures provide a general ambient illumination while incandescent sources are used primarily for accenting and display purposes. Most fluorescent fixtures have milk-white opalescent lenses which are extremely dirty and need to be cleaned, and in some cases, replaced due to damage or excessive yellowing. Incandescent fixtures generally appear in good condition and are working properly. Some illuminated exit signs need to be replaced due to apparent unintentional damage.

Exhibition halls and meeting rooms have four foot by four foot, six lamp type fluorescent fixtures. The general ambient illumination level averages approximately 35 footcandles. It was noted, however, in areas where opalescent lenses had been removed and lamps are exposed, the average ambient illumination level increased to 70 footcandles. The lighting system does not provide multiple levels of illumination, and switching control is accomplished only on a column bay basis. Incandescent lighting system in exhibition halls is quite minimal, apparently providing only improved color rendition and some scattered accent lighting.

The incandescent lighting system in meeting rooms is considerably more useful than exhibition halls in that, the system provides multiple switching control and various illumination levels and lighting patterns when dimming feature is utilized. The combination fluorescent and incandescent lighting system appears to satisfy the multi-use needs of these rooms.

The dimmable incandescent lighting systems of the auditorium and stage provide an acceptable range of illumination levels as suggested by current standards of good lighting system design practices. The stage system has successfully been utilized for large stage productions with "house" auditorium lighting operating in a supplementary fashion as needed. Minimal lamp burn-outs were noted and some dimmer controls need major overhauling or replacement.

8. Fire Alarm System:

The Fire Alarm System is a supervised, electrically operated, closed circuit type consisting of manually operated pull stations and minimal automatic heat detectors located in elevator and mechanical spaces only. No automatic smoke detectors are evident, nor is there any provision for fire alarm voice communication in the system control panel. There is a connection to the sprinkler system and the system is municipally connected to the Boston Fire Department via a master box located at the administration office entrance on Boylston Street. A 14-zone capacity flush wall mounted annunciator with 12 active zones is located at the administration office entrance. Municipal system service is provided via telephone system underground service conduits entering main electric switchgear room.

The operation of the systems is such that upon actuation of a manual pull station, automatic heat detector or sprinklerhead, all horn signals throughout the facility sound a continuous signal until manually restored or shut off by a time limit cut-out; and trip the master box thereby sending a coded signal to the Boston Fire Deparmtent. Refer to Volume II for documented correspondence with the Boston Fire Department.

9. Radio And Television Master Antenna System:

A radio and television master antenna system consisting of combination off-air/closed circuit television and FM radio outlets, roof mounted master antenna assembly, main and pre-amplifier cabinets and distribution equipment for off-air and closed circuit origination and reception is installed throughout the existing facility. Combination off-air/closed circuit TV and FM radio outlets are located in exhibition halls, stage, meeting rooms, foyer, offices, and press rooms. The system is most often utilized for off-air reception. The present signal strength of combination TV/radio outlets is extremely weak. It is believed this condition is caused by excessive corroding of the existing roof mounted antenna assemblies or line loss. The closed circuit origination and reception feature is very seldom used owing to commercial and private television stations when broadcasting from the facility, provide their own broadcasting and cabling equipment in order to control and maintain their standard of reliability.

10. <u>Clock System:</u>

The clock system is of the electronic type consisting of master clock and central control panel, secondary clocks, electronic frequency generator, and electronic receivers. The master clock and central control panel is located in the main electric switchgear room. Secondary clocks are located in areas such as auditorium, meeting rooms, press rooms, offices, lounges, and foyers. There have been operational problems with the system in the past; however, at present it is operating correctly. A few of the secondary clocks have been removed exposing the clock outlet box and wiring. The master clock and central control panel also incorporates timers for control of exterior marquee and entrance vestibule lighting. This control has proven to be inappropriate due to the often times sporatic usage of the facility negating the need for automatic clock controlled lighting.

11. <u>Sound/Paging System:</u>

A sound/paging system is installed throughout the complex consisting of a building-wide central loudspearker system, auditorium loudspeaker system, exhibition hall loudspeaker system, and meeting room loudspeaker systems. Microphone and selective paging controls in the Administration Manager's reception office provide the ability to make selective or "all-call emergency" announcements to any or all areas of the facility.

The central loudspeaker system provides building-wide reinforcements of speech, paging, general announcements, and background music. Loudspeakers are located on ceilings and walls in lobbies, restrooms, major stairhalls and corridors. A separate control room houses all major sound equipment such as two channel control console, patch panels, switching equipment, regulators, mixers and amplifiers.

The auditorium loudspeaker system is of the theatre type with high and low frequency horns located at the proscenium above the center line of the stage. Microphone jacks are located in floor and wing walls of stage and walls of audience area, and permanent microphones are suspended from stage ceiling. Associated control and amplification equipment is located in the same control room as central loudspeaker system equipment; however, ideally mixing and sound equalizing controls should be located in the auditorium proper.

Exhibition halls and meeting rooms loudspeaker systems provide reasonable sound coverage in most areas for speech reinforcement, paging and general announcements, and background music. Portable equipment is available to plug in, to allow independent local control of amplified sound which originates in these spaces. Exhibition hall systems do not provide a sound coverage and quality as good as meeting room systems, but is acceptable due to the multi-usage of the space. An evaluation of sound coverage will be made in the next stage of design.

The loudspeaker systems throughout the facility appear to be in reasonably good working order. Maintenance problems have been minimal to normal and servicing response creditable.

12. Wireless Paging System:

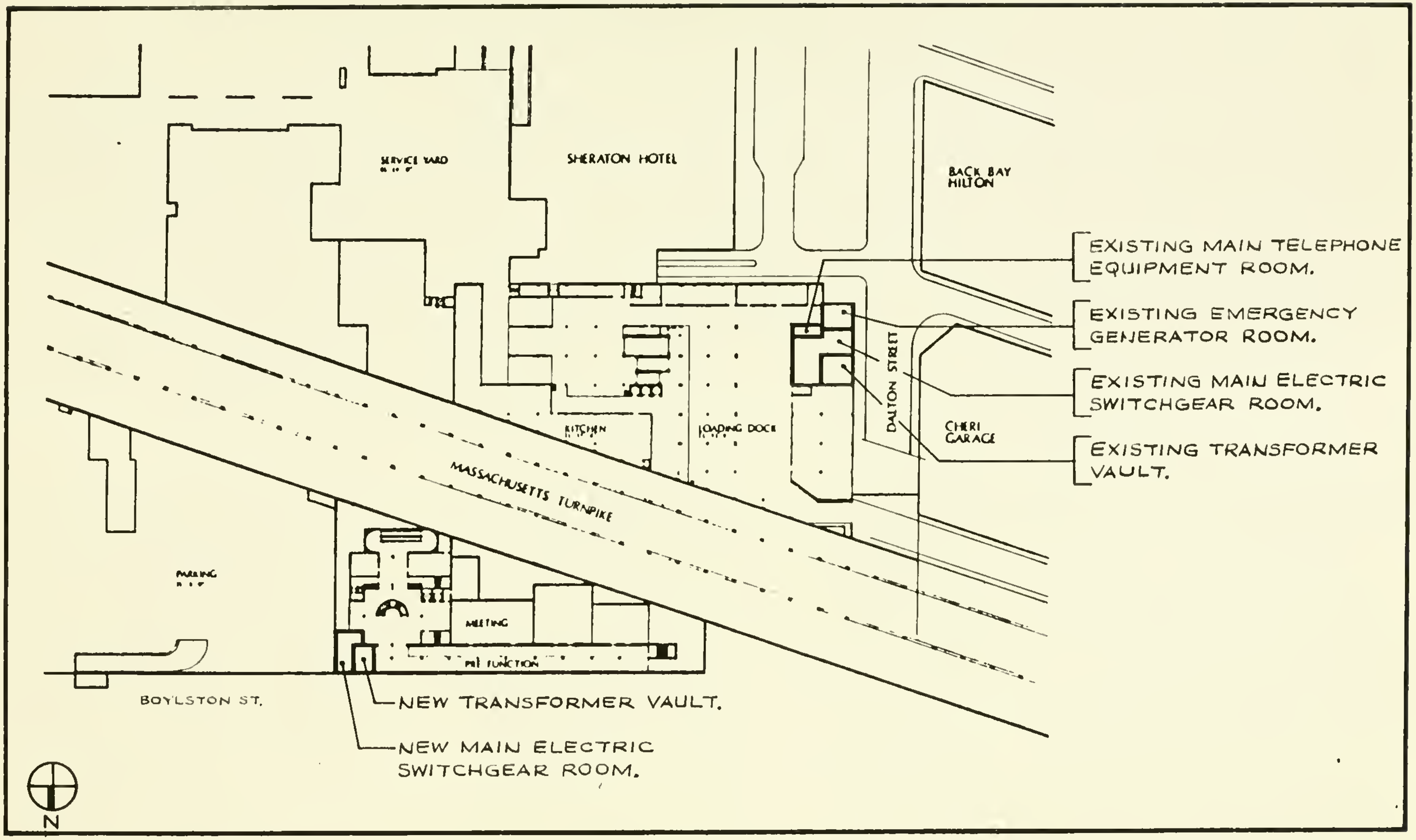
A wireless paging system including dial type telephones, dial transmitter equipment, portable receivers, and antenna loop wire was installed in the original contract. The system is no longer used. Portable receivers (pocket page devices) are missing, and the general operation of the system is unknown. The building-wide sound/paging system is now used for all paging requirements.

13. Exterior Door Intercommunication System:

An exterior door intercom system is installed to provide communication between basement truck dock entrance and the administration reception office on the first floor. The system consists of flush mounted control/annunciator panel and flush wall mounted moisture-proof speaker/pushbutton call-in station. The system is operational and has required minimal service calls.

14. Security Assistance System:

A security assistance system consisting of pushbuttons for surface mounting on the underside of counters at ticket booth and portable desk areas and an annunciator control panel in administration reception office was installed under the original contract. This system has seen limited usage, is operational, and has required minimal servicing. The pushbuttons have a cord assembly which can be connected to wall or floor, mounted flush junction boxes located in ticket booths and main entrance vestibule area.



HYNES AUDITORIUM EXPANSION

E·1 LOWER LEVEL (BASEMENT) PLAN — ELECTRICAL SCALE: NONE

LOTTERO & MASON ASSOCIATES, INC. **CONSULTING ENGINEERS**

Item 15

C. Proposed Expansion:

1. The proposed expansion and renovation of the existing structure requires that the entire facility be constructed and the interior electrical systems installed in accordance with the latest edition of the Mass. State Building Code and the Boston Fire Department, Fire Alarm Regulation #1, dated November 1, 1982. The impact of the State Building Code and Fire Alarm Regulation #1 is principally felt in the design and operation of the emergency generation system and fire alarm system. The hereinafter proposed designs of each of these systems meet or exceed the requirements set forth by the Code and Regulation.

   In addition to compliance with the Mass. State Building Code, all work proposed in this electrical section will be installed in accordance with the Mass. Electrical Code (MEC), the Occupational Safety and Health Act (OSHA) and all local ordinances governing electrical installations in Boston, Mass.

2. Main Electric Service:

   The existing Dalton Street 13,800 volt, 3 phase underground primary electric main service will be maintained; however, the four 1,000 KVA transformers within the existing transformer vault are inadequate to serve the anticipated new loads of the expansion program. The secondary switchgear, double and single ended load centers, motor control centers, and other distribution equipment and branch systems will generally be maintained and modified to suit power and lighting requirements in renovated areas within the existing structure.

   A new 13,800 volt, 3 phase underground primary electric service from Boylston Street with transformer vault and secondary switchgear located in basement of new C Building is proposed to supplement the existing Dalton Street service and power the majority of the new addition. This new service in conjunction with an expansion of the existing Dalton Street service will be capable of handling all existing and proposed expansion loads including a complete conversion of the existing heating and cooling system to all electric, or a partial conversion of a combination of steam heating and electric cooling. A breakdown of connected loads associated with each of the heating/cooling systems proposed is included in Volume II.

Conversations with Boston Edison Company indicate the existing transformer vault can be expanded to meet the new load demands. Refer to Volume II for documented confirmation. Expansion of existing transformer vault will consist of replacement of the four 1,000 KVA transformers, associated primary and secondary disconnecting devices and the 3,000 ampere secondary collector bus with capacity increases in accordance with new load demands within the existing structure.

3. Emergency Generator And Distribution System:

The existing emergency generator will be maintained in place and continued feeding the specific duplex condensate pumps and chilled water pumps associated with the HVAC system, communication systems, sound/paging system and emergency lighting fixtures throughout egress and public areas, auditorium, exhibition halls, and meeting rooms in the existing structure. The engine cooling system of the existing generator will be disconnected and removed due to its reliance on the city water source. A new engine mounted or remote mounted radiator type cooling system will be installed. The existing generator installation will be reviewed for compliance with all Environmental Protection Agency requirements and the Mass. Department of Environmental Quality Engineering noise level guidelines.

A new diesel driven standby emergency generator, located on the roof at the northern most end of new C Building, and interior distribution system will be provided to serve new life safety emergency lighting requirements in all public and egress areas, new fire alarm and voice/tone evacuation system, communication systems and other critical loads such as fire and jockey pumps, sump and sewage ejector pumps, passenger elevators, and smoke exhaust systems. Refer to Volume II for a breakdown of preliminary loads and equipment to be connected to the new emergency generation system.

The existing and new emergency generators will be synchronized so that upon the loss of the respective existing or new normal electric service, the associated emergency generation system will be brought on line. However, in the event of a total normal service failure, where both existing and new services are lost, both emergency generation systems will be activated.

4. Exhibition Area Power:

The existing overhead plug-in bus duct system in exhibit areas appears adequate for power needs. An extension of this system's power to new floor boxes is proposed to provide most frequently used utilities to exhibitors. The feasibility of installing a floor box system in the existing structure will be examined in the next phase of work with regard to physical size of floor boxes, structural element constraints of existing floors, and cost implications associated therewith.

A recent fire in the exhibit space illustrated that the main circuit breaker protecting the bus duct within the fire area did not react to fire damage to the bus duct. An investigation and study will be performed to ascertain where the deficiency exists in the system. To be analyzed will be the advantages and disadvantages of installing ground fault protection on exhibitors plug-in connections to overhead bus duct.

A new power and lighting distribution system for new exhibit and meeting spaces will be provided to meet programmatic needs. A decision will be made in the next phase of design work to determine the best and most economical method of providing power to exhibitors from either ceiling suspended plug-in bus ducts only, or a combination of flush mounted floor boxes and ceiling suspended plug-in bus ducts. Structural implications, accessibility, maintenance, and flexibility will be examined along with first cost effectiveness.

5. Telephone System

The existing New England Telephone service and interior conduit distribution system will be maintained. Preliminary discussions with telephone company personnel indicate the existing four 4-inch underground service conduits entering the existing basement main electric switchgear room on the Dalton Street side are adequate to serve the building expansion and all interior program requirements. Refer to Volume II for documented confirmation.

A new empty conduit and equipment mounting board distribution system will be provided extending from the existing basement main telephone equipment room to the new addition. Empty conduits from equipment mounting boards will be furnished to all new outlet and multi-jack cabinet locations for concealment of telephone wiring. Floor and wall mounted outlet boxes, multi-jack cabinets and dedicated empty raceways will be provided to meet functional program requirements.

6. Lighting:

The existing lighting system in non-renovated areas will be maintained. All fixtures will be cleaned, relamped and repaired where necessary. The space and functional program requirements suggest lighting in exhibit and meeting spaces be high intensity discharge type with various levels of controlled illumination to suit space utilization. For example, 20 footcandles for housekeeping, 30 footcandles for show erection and dismantling, 50 footcandles for normal show levels, 70 footcandles for higher show levels and 100 footcandles for highest show levels are suggested. As noted earlier in Part A Existing Systems of this report, the existing average illumination level is approximately 35 footcandles with various levels of illumination provided by controlling the fluorescent fixtures on a column bay basis. A thorough cleaning and relamping of this existing lighting system, and possibly the replacement of the existing milk-white opalescent lenses with clear acrylic prismatic lenses could increase the average illumination level to approximately 65 to 75 footcandles. Therefore, maintaining and upgrading the existing fluorescent lighting system in these spaces, versus removing and installing a new high intensity discharge type system offering a greater degree of illumination level flexibility will be very seriously evaluated in the next phase of design work with respect to first costs, advantages of illumination flexibility, and extent of general renovation work within specific areas.

Lighting systems in new exhibition areas adjacent and open to existing exhibition areas and lighting in totally separated new exhibition areas, will be evaluated with respect to program required multi-level illumination control when utilizing a fluorescent system versus a high intensity discharge system. New meeting rooms will be provided with a multi-level fluorescent or high intensity discharge system and a dimmable incandescent system.

Lighting in prefunction and lobby areas will be a combination of low brightness fluorescent and decorative/accent incandescent. Lighting control will provide moderate flexibility in order to accommodate the possible usage of the spaces by small exhibitors. Illumination levels will be in the range of 25 to 50 footcandles depending on the programmed usage.

The existing auditorium and stage lighting systems will be maintained where architectural renovations permit. Where changes must be made, lighting systems similar to the existing incandescent system will be installed. Faulty dimming equipment will be repaired or replaced as required.

It is suggested the lighting in large areas such as exhibition spaces and meeting rooms be controlled from a central control point, possibly integrated with a building-wide central control monitoring system. The feasibility of incorporating this type of control in existing lighting systems will be studied in the next phase of design.

Emergency lighting will be provided throughout the new addition including illuminated exit signs at all egresses all in accordance with the Mass. State Building Code. Emergency and exit lighting will also be added in the existing structure as required for compliance.

Where the Owner elects to engage the services of an outside lighting consultant for specific interior design, this office will review such designs for energy code compliance with the Mass. State Building Code.

7. Fire Alarm System:

The existing fire alarm system is functionally inadequate to serve the fire safety requirements of the renovation and expansion program and is in violation of the Mass. State Building Code and the City of Boston Fire Department Regulation #1. Therefore, the existing system will be removed with the exception of usable existing components such as manual pull stations, heat detectors and sprinkler system connections which will be maintained where compatible with the new system.

The new fire alarm system will be an electrically operated, zone sounding non-coded, double-supervised, closed circuit transmitter loop, voice/tone evacuation type system. All units of equipment will be listed by Underwriters' Laboratories for fire alarm signalling use and the entire system will be U.L. Listed for fire evacuation and will comply with all applicable N.F.P.A., Mass. State Building Code and City of Boston Fire Department regulations and requirements.

The general operation of the system will be to give notice to the Boston Fire Department and to the occupants of the property of the existence of a fire, to provide for a sounding (tone or voice messages) of alarm signals throughout the building and to constantly supervise the interior system and to give notice of any trouble and/or derangement of the system.

The system will consist of but not be limited to the following:

- Zoning and audible alarming of all flow switches of fire suppression system with "trouble" monitoring of associated O.S. & Y. valves.
- One-way voice communication system (public address) from a fire command center to all areas throughout the building for transmission of voice messages to building occupants on a selective or all-call basis.
- Two-way voice communication system from the command center to the fire pump room and each elevator cab, elevator lobby, and every floor landing in all stair halls for two-way communication by fire department personnel.

- Automatic smoke detectors surface ceiling mounted in all smoke exhausted egress and public areas, ceiling of grand lobby and on underside of each floor area projecting into grand lobby.
- Automatic smoke detectors (with remote ceiling mounted "alarm and trouble" indicators) mounted in HVAC duct work to shutdown supply, return and outdoor air fans.
- Manual pull stations throughout all egress areas.
- Speaker/Light (A/V) Combination Signal Units throughout the entire facility.
- Fire Command Station and Annunciator at fire command center will not only include hereinbefore noted equipment, but also the following:

  Status indicator for all elevators.
  Status indicators and controls for each air handling unit and all smoke exhaust systems.
  Controls for unlocking all stairhall doors where applicable.
  Emergency distribution system status indicator.
  N.E.T.Co. telephone outlet.

- Remote City of Boston Key Repository at main entrance lobby.

8. <u>Radio And Television Master Antenna System</u>:

The existing radio and television master antenna system which consists of combination off-air/closed circuit television and FM radio outlets, roof mounted master antenna assembly, main and pre-amplifier cabinets, and distribution equipment for off-air and closed circuit origination and reception will be maintained. The entire system will be tested and faulty or defective equipment will be replaced. The existing corroded roof mounted master antenna assembly will be replaced with a new state-of-the-art antenna assembly and all central amplification and distribution equipment will be reconditioned or replaced to provide the latest present-day system sophistication. The system will be extended to new exhibition halls, conference areas, meeting rooms, administrative offices, press rooms, banquet/ballroom, prefunction areas and VIP lounges as needed to meet program requirements.

9. Clock System:

The existing electronic clock system consisting of master clock and central control panel, electronic frequency generator, secondary clocks and electronic receivers will be completely reconditioned. The entire system will be tested and faulty or defective equipment, or obsolete equipment, will be replaced. Timers contained within central control panel assembly which control exterior marquee and entrance vestibule lighting will be removed. New secondary clocks will be installed on all existing outlets where clocks are missing. The system will be extended to new areas such as exhibition halls, conference and meeting rooms, offices, kitchen, press rooms, banquet/ballroom, prefunction and lobby areas, lounges, and all other areas as needed to meet program requirements.

10. Sound/Paging System:

The existing sound/paging system installed throughout the existing structure consisting of a building-wide central loudspeaker system, auditorium loudspeaker system, exhibition hall loudspeaker system, and meeting room loudspeaker systems will be maintained in place. The entire system will be tested and faulty or defective equipment will be replaced. The present paging and selective controls in the administration manager's reception office will be incorporated in a new sound/paging central control console which will be furnished with the new sound system equipment for the building expansion.

The existing building-wide central sound/paging loudspeaker system will be extended to new public areas such as lobbies, corridors, major stairhalls and restrooms. Ceiling and wall flush mounted loudspeakers will be installed in these areas. New amplification, power supplies, and equipment rack will be furnished either at existing sound equipment rack or in a new sound control and equipment room within the new addition and interfaced with existing building-wide system. The new equipment will be capable of reinforcing speech, paging, general announcements and background music. A new central control and paging console will be furnished in the existing administration manager's reception office which will incorporate the existing equipment.

New exhibition halls, banquet/ballroom, and meeting rooms will be furnished with local or independent sound systems. Each system will provide for local pickup, amplification, and reproduction of local microphone, phonograph, or tape programs. Systems will provide good overall sound coverage and where required by program, speakers will be positioned and directed to produce directional sound realism. By use of priority relays, the building-wide sound/paging system will be able to take priority control of the local sound system loudspeakers for all-call or selective emergency paging. Local systems will be capable of reproducing sound film programs from sound film projectors plugged into wall or floor mounted audio/visual jacks. Audio/visual provisions will also be included in other areas such as media and projection rooms.

11. Intrusion Alarm And Video Surveillance System:

A new electrically supervised intrusion alarm door detection and video surveillance system will be installed throughout the existing and new facility. The system will include magnetic contact door switches, ultrasonic motion detectors, closed circuit video cameras and monitors, and annunciator control panels. Door switches will be installed on all exterior doors and interior doors to high value equipment rooms, box office rooms, VIP lounges, building central control room, etc. Motion detectors will also be located in these spaces to augment security measures. The unauthorized intrusion of these areas, or unlawful entrance/exiting of perimeter doors will be annunciated both visually and audibly at a central annunciator control panel in the building security office. Zoning will be on an individual room or entranceway basis to pinpoint violated area. Closed circuit video cameras will be located in all exhibition area entry and exits and all unsupervised corridors and loading dock areas to provide visual control from monitors located in building security office. All alarms caused by violation of secured areas will be automatically recorded on a printer/recorder furnished with the system.

12. Wireless Paging System:

The existing wireless paging system consisting of dial type telephones, dial transmitter equipment, portable receivers, and antenna loop wire is no longer used. Therefore, it is suggested this system not be extended to the new expansion area.

13. Exterior Door Intercommunication System:

The existing exterior door intercommunication system consisting of a speaker/pushbutton call-in station at the basement truck dock entrance and a control/annunciator panel in the existing administration reception office is operational and used on a limited basis. The system should be tested and faulty equipment replaced. It appears at the present time that an extension of this system to the expansion area is not necessary. As the design progresses, this decision may be changed.

14. Security Assistance System:

The existing security assistance system consisting of surface mounted pushbuttons on ticket booth counters and desks and an annunciator control panel in the administration reception office is operational and is currently being used. The system should be tested and faulty equipment replaced. An extension of this system to new ticket booths or similar areas will be provided as needed to meet program requirements. Wall and floor outlets to match existing will be provided to accept existing and new portable pushbutton and cord assemblies.

D. Options And Recommendations:

1. It is recommended that the following existing equipment and systems be inspected, tested, and where defective, replaced prior to reuse as suggested under the Proposed Expansion.

   a. Existing secondary switchgear and distribution equipment.
   b. Existing emergency generator and distribution equipment.
   c. Existing overhead plug-in bus duct system in exhibit areas.
   d. Existing fire alarm system components to be reused.
   e. Existing electronic clock system components to be reused.
   f. Existing building-wide sound/paging system, auditorium system and meeting room systems.
   g. Existing radio and television master antenna system.
   h. Existing exterior door intercommunication system.
   i. Existing security assistance system.

Phasing

1. During Phase I reconstruction of Commercial Block C all existing electric services and systems will be phased out and disconnected. A new transformer vault, main switchgear room, diesel driven emergency generator and associated distribution system, extensions of existing and installation of new low tension systems such as electronic clock system, central sound/paging and local sound systems, and radio/television master antenna system will be installed to serve program requirements of new spaces. Provisions will be made to temporarily backfeed existing distribution system equipment so that work can begin on the renovation and expansion of existing transformer vault and switchgear on the Dalton Street side of existing basement. New fire alarm and intrusion alarm and video surveillance system central equipment will be installed as well as audio-visual provisions in specific program required rooms.

2. Renovation/construction work of Phases II and III will include the extension of power, lighting, and low tension systems into renovated and new spaces from new and upgraded existing central equipment. Completion of renovation to existing transformer vault and switchgear will be accomplished and temporary provisions from new Boylston Street service removed. Both new and existing services will be on line providing a balanced power distribution system with adequate spare capacity for future growth.

3. Considering the construction phasing plan proposed by the design team, wherein the existing facility is to remain operational, the foregoing electrical system phasing plan is suggested in order to minimize interruptions in electrical system continuity.

2. Summary of Tour to Competitive Facilities

SUMMARY OF TOUR TO COMPETITIVE FACILITIES

A. On May 7, 1982, a tour was conducted of three recently completed convention centers across the country. These had been selected by the Program Consultant for the purpose of studying facilities exemplifying the state of the art in this area. The three centers were:

- Baltimore Convention Center, Baltimore, Maryland
- Georgia World Congress Center, Atlanta, Georgia
- George R. Moscone Convention Center, San Francisco, California.

The participants on the tour were:

- Leonard Greene, Auditorium Commission
- Albert Kramer, Manager, Hynes Auditorium
- Robert E. Cumings, Greater Boston Convention & Tourist Bureau
- Daniel Mitchell, Greater Boston Convention and Tourist Bureau
- Gary Sieland, Sheraton Boston Hotel
- Lawrence Koff, Boston Redevelopment Authority
- Robert Kroin, Boston Redevelopment Authority
- Victor E. Hagen, Public Facilities Department
- Walter Ernst, Perez Associates
- Don Jewell, Event & Facility Consultants
- Henry A. Wood, Kallmann, McKinnell & Wood, Architects
- Michael McKinnell, Kallmann, McKinnell & Wood, Architects

The following comments reflect the consensus arrived at by the participants in this tour as they relate to the expansion of the existing Hynes Auditorium.

B. Program

It was generally agreed that Boston would not be able to compete with facilities as large as the Georgia World Congress Convention Center due to the extremely limited area that can be provided under any of the practical plans on the existing site. It was, however, agreed that the greatest draw for Boston will continue to be medical, educational and high technical groups for which the meeting room facilities can and must be greatly increased in number, size and finish

The two great advantages that Boston has in seeking convention business is the City's overall desirability as a destination for many of the groups that would come. The second is the adjacency of such a large number of hotel rooms and this far exceeds the capacity of any of the cities visited.

C. Exhibition Space

It was agreed that the exhibition space in Hynes cannot be increased dramatically. It can be larger than the small facilities provided in Baltimore, but cannot begin to approach the facilities in Atlanta and San Francisco. The Convention Bureau staff stressed the desirability of obtaining a grand total of exhibition space of at least 200,000 sq. ft. In addition, they noted the advantage of being able to obtain 120,000 sq. ft. on one floor. All of the centers visited had all of their exhibit space on the same level.

D. Auditorium

There was a general concurrence by all present that the auditorium space in Hynes must remain in the plan location where it is, as it is impossible to get any other equivalently large location which can be developed column-free. The absolute minimum seating would be 2,000 - 2,500, but it is extremely advantageous to be able to go as far as 4,000.

Both Mitchell and Kramer strongly pushed for filling in the existing auditorium space and thus moving the function to the second floor, primarily due to the additional space gained and the desirability of having the entire ground floor as exhibition space. Although there had been some earlier discussion about the constraints in reducing the overall height in this space from 50' to 30', it was felt that this was not an overriding point.

E. Meeting Rooms

There was not a great deal of discussion on these spaces, except the general agreement that the ones seen at the other centers reflected the level in finish and flexibility that would be required in any new facilities in Boston. It was noted that they can be scattered on different floors, as long as there is adequate circulation and break out space.

The following specialized points were made:

- It is essential to get a high quality, acoustical, movable wall. Modernfold generally got the highest ratings from the facility managers visited. The best ones also seemed to have carpeted wall surfaces.

- All meeting rooms visited were carpeted and it was agreed that this was the proper floor finish.

- Although only one facility visited had a picture hanging strip, it was generally agreed that this would be a considerable advantage.

- The secret in meeting room lighting is flexibility. The general consensus was that it should be a mixture of fluorescent and incandescent. The former for overall, high ambient levels, and the incandescent for dimming and highlighting. Some concern was expressed, however, about overly complex control circuits and Jewell recommended overall dimming. It was also a general feeling there should be a light track for special illumination at a head table.

- Although simultaneous translation facilities were provided at both Atlanta and San Francisco, it was not felt that this would really be necessary for Hynes.

F. Operation and Facility

All the facilities visited had very large, permanent staffs, either city employees or employees of a management company that contracted the operation.

The managers of all facilities visited stressed the desirability of having full kitchen facilities within the structure and added that they provided considerable profit centers within the overall operation.

G. Conclusion

Agreement was reached on the following, primary conclusions:

- Boston has in the Hynes site a better location with regard to hotel proximity than any of the centers visited.

- The proposed exhibition space at Hynes is very tight, and at least 200,000 sq. ft. should be sought.

- It is essential to maximize the number, flexibility, and quality level of the meeting rooms, and to provide adequate adjacent, pre-function space.

On the following pages, more detailed descriptions and plans are given of the three facilities visited.

KALLMANN, McKINNELL & WOOD, ARCHITECTS, INC. 127 TREMONT STREET BOSTON MASS. 02108 617-482-5745

May 12, 1982

MEMORANDUM
Baltimore Convention Center

CONTACTS

Wayne Chapel
Director of Baltimore Convention Bureau
301/659-7000

Tom Mobley
Executive Director, Baltimore Convention Center

ARCHITECTS

Naramore, Bain, Brady & Johanson
Seattle, Washington

OPENED - August 1979

CONSTRUCTION COST

$30 million for the building.
$51 million including furnishings and other project costs.

LOCATION

Convention Plaza
1 West Pratt Street

in the downtown harbor redevelopment area connected to the Hyatt Regency Hotel by sky bridges, also adjacent to Rouse Company's "Harbor Place".

PHYSICAL DESCRIPTION

The building occupies a slightly sloped site and there are two entrances at diagonally opposite locations in the plan. The lower level is at the level of the four major exhibit halls and is connected to a mezzanine level which runs between the halls connecting to the upper lobby entrance. Above this are located the meeting rooms and lounge areas.

1. Operations

   The Center is run directly by the City with all City employees. There is a total staff of 69, including accountants, etc., of which 52 are cleaners, security men, etc. There is an office staff of 18 with 600 sq. ft. space.

2. The Convention Bureau is also located in the facility and has 2,600 sq. ft. but they say it already needs 4,000 sq. ft. Apparently, the response by

exhibitors has been better than they had anticipated.

3. They use their in-house mechanical and electrical staff for hook ups. This includes one electrician proper and six maintenance people who are generalists and do much of this work. They also have in-house shops. In addition, custodians act as set-up men.

4. All City employees are union men and apparently they have union stagehands as well. However, decorators are allowed to bring in non-union personnel.

5. Their booking policy is that conventions and trade shows are booked through the Convention Bureau, however, any free dates less than 13 months in advance can be booked directly by Tom Mobley.

6. They have a central kitchen with all of the china, silverware, etc. They can serve a maximum of 4,500 for lunch and 3,500 for breakfast. All of the food preparation is done by contract by ARA. They indicated that 90% of all conventions use food services.

7. They feel that security is very important and that they have a good system. Although they have heavy coverage by closed circuit TV, they do not find it that useful. Even when nothing is going on they have a two man minimum security force - one at the control monitor and one roving through the building.

EXHIBITION SPACE

1. They have two halls of 30,000 sq. ft. and two halls of 25,000 sq. ft. The halls themselves are the handsomest we saw in any of the facilities and obviously the most expensive. Ceiling height is 33' at the high flat portion and 18' at the beams between halls.

2. Floor boxes at 30' on center generally work okay. They said that for a very high electric usage they can drop 100 amp lines from above.

3. On the outer edge of each exhibition hall there is a service corridor and also the grouped restrooms.

4. There are two permanent concessions built into the outer walls of the exhibit halls.

5. Wayne says that he goes up to 4,000 or 5,000-people large meetings on his flat floors. For events above that they use the nearby Civic Center which goes up to 11,000, although it is primarily used for sporting events.

MEETING ROOMS

1. On the meeting room floor there are 41,000 sq. ft. which can be divided into 23 rooms providing capacities from 50-2,000. The larger space is

actually a conbination of four spaces - a total dimension of 84' x 169', giving slightly over 14,000 sq. ft. On this floor there are three lounges, as well as an outdoor terrace, and all of these spaces open down into the two lobbies below. In addition, there is a full service corridor on the other side of the meeting room from the lounges. Wayne generally feels that the meeting room to lounge ratio is about right. He said that he has no problem on mixing different groups on this meeting room level and can easily divide them off by ropes and stanchions.

2. The largest meeting rooms have 14' ceilings which Tom says is really too low for the 14,000 sq. ft. He also said the shape of this room is not very good, being roughly a 2:1 ratio.

3. Six of the meeting rooms are glazed, which he said generally works out quite well, except for medical and engineering groups that use lots of slides. He said it is particularly good where lunches and cocktails tie in but bad where the attention of the participants is important. The venetian blinds they have do not do an adequate job of closing off and he said they really should have blackout curtains.

4. They said that they really do not have enough storage on the floors with the meeting rooms and most of the storage of chairs, tables, etc. has to take place in the basement.

ENTRANCE/REGISTRATION

1. Wayne said they have had as many as three different events going on at the same time, all using the same entrances, and have not had any problem. He said at some times they've gone up to as many as 6-7 smaller events.

2. He said the main Pratt Street lobby has a 40' ceiling height and they even use it for exhibition space for such things as boats. He said also they use it a great deal as lounge/cocktail space.

3. He said the upper Sharp Street lobby probably got more business than the other major one due to its closer location to the hotels and they often use it also for registration/cocktails and even exhibition.

SERVICE

1. Trucks can roll directly onto all floors and they feel this is a very important factor.

BUDGET

1. They expect to run at a $2.1 million budget this year and about a $2.4 million budget next year. Against this they will have a $1.2 million revenue this year of which about $500,000 will come from rentals, $200,000 from catering, and $200,000 from utilities.

---

2. Their rental rates are 25¢ a net square foot for six days, or 30¢ a net square foot for ten days. This comes to about $15,000 for a six-day event for two 30,000 sq. ft. halls. He said basically they have had no problems with their rate structure.

3. There is a 10% hotel room tax of which 50% goes to the State and 50% to the City. By law this cannot be dedicated to the Convention Center but it is generally earmarked in this direction. $1.6 million will come to Baltimore this year and $918,000 will go to the Convention Center. They are also setting up a membership program for additional support and anticipate $140,000 this year.

4. Their rent structure includes set up of meeting rooms, however, any change overs are charged at 50¢/chair.

<u>MAINTENANCE</u>

1. Tom said that the very high suspended glass system has been extremely expensive in that occasionally the large tempered glass sheets do get broken and due to their very large size replacements have to come from Pilkington's in England.

2. Tom also feels there is too much stainless steel, which really does require a lot of work. They say they polish it every day.

3. Carpet always seems to be a problem and they find that it is wearing out much faster than they had anticipated.

<u>GENERAL</u>

1. Apparently this Center has been extremely successful, particularly for medical and high-tech meetings. They feel that a medium size building of a very high quality makes them extremely competitive. They say they are helped by the fact that there is a generally low hotel rate by east coast standards.

2. It is so successful that they are already talking about expanding it and apparently have an equivalent area immediately adjacent in which they could expand.

Henry A. Wood

41 Baltimore

Exhibition Center: BALTIMORE CONVENTION CENTER
22 LIGHT STREET, SUITE 502
BALTIMORE, MARYLAND 21202

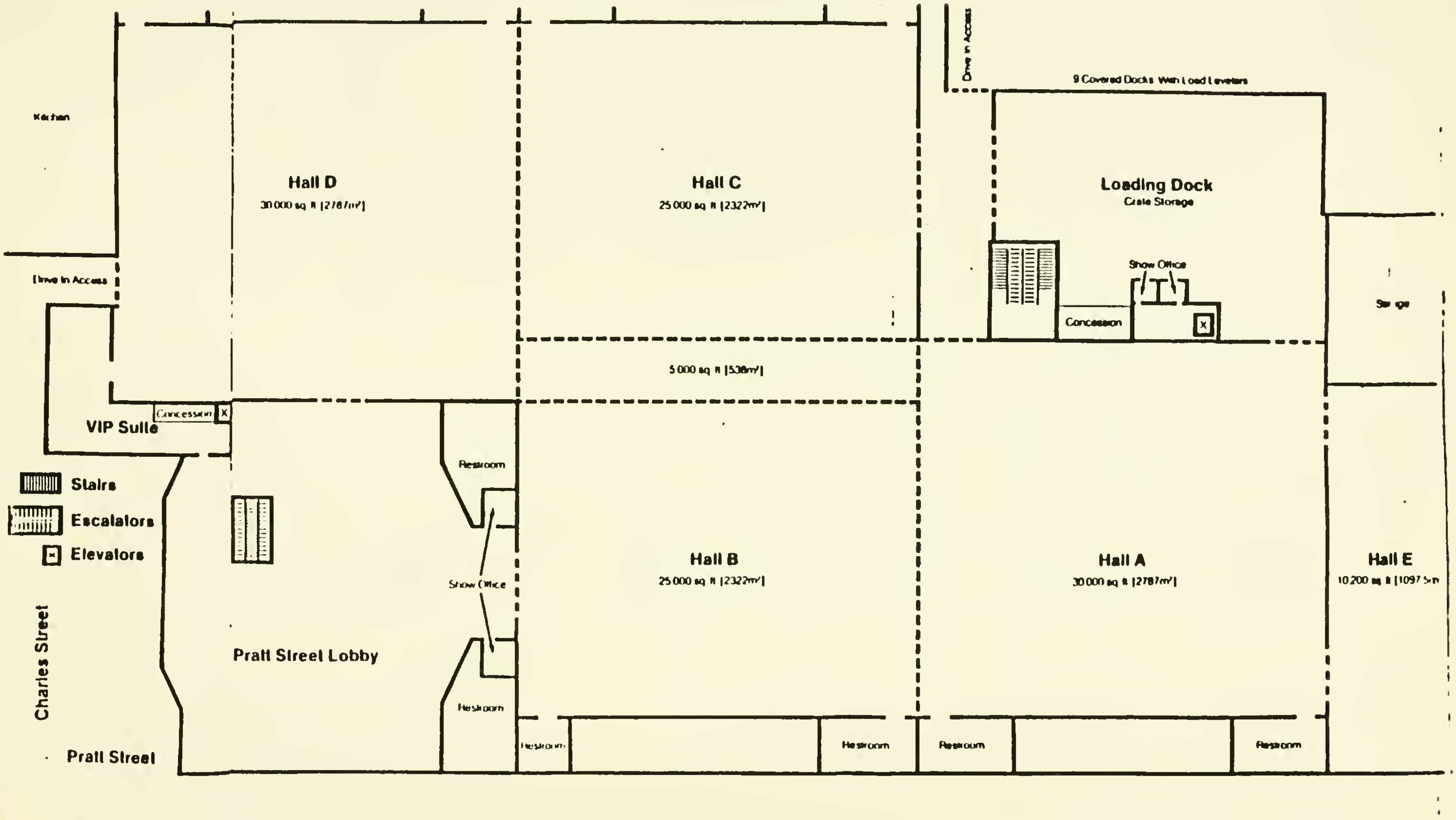
General Manager: JIM ROSS

Telephone: (301) 727-5688

Exhibition Space - Total Square Footage: 110,000

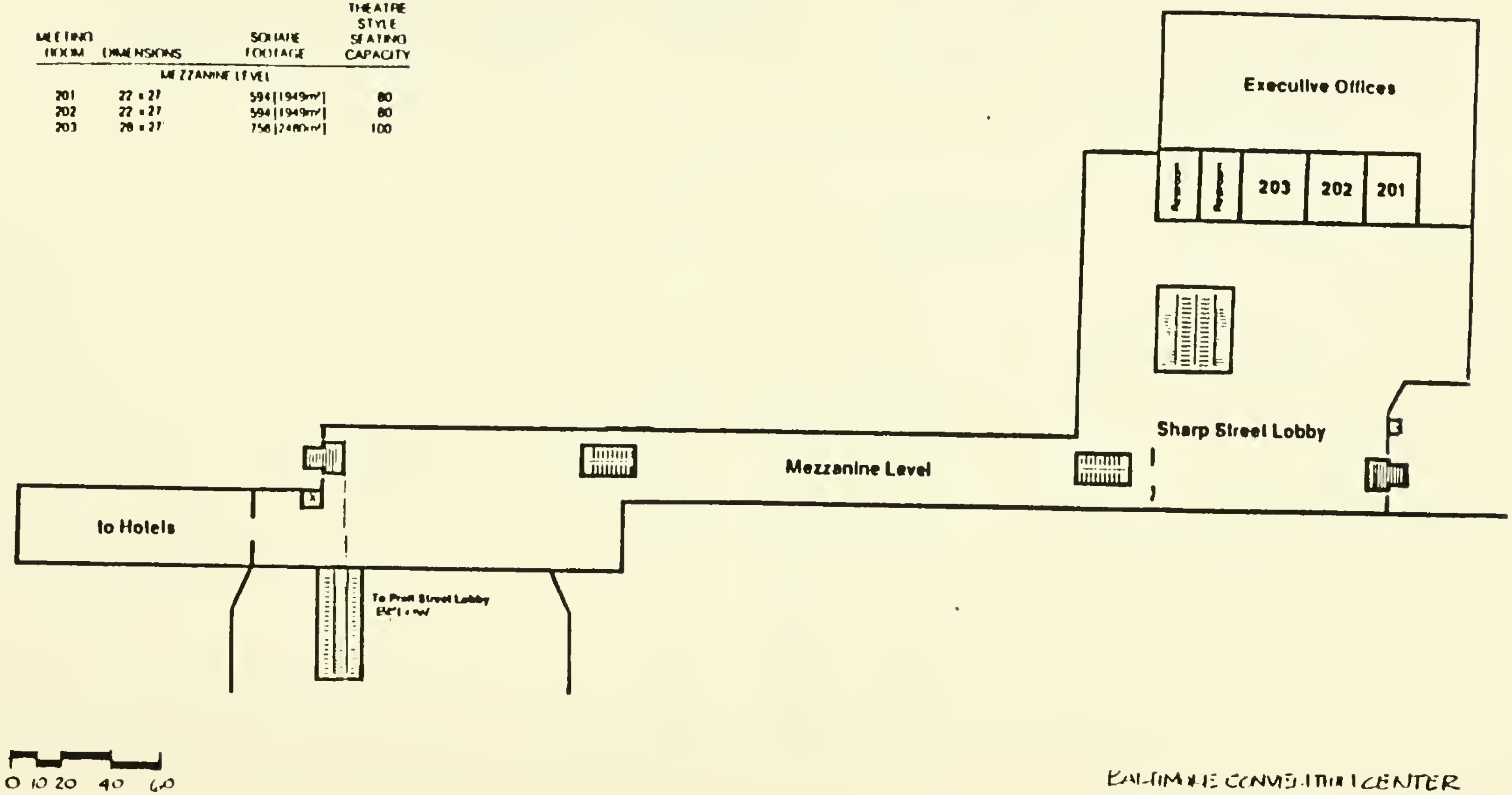
Estimated Number of Visitors per year:

	Hall "A"	Hall "B"	Hall "C"	Ballroom
Exhibit Area Square Footage	30,000	30,000	25,000	25,000
Floor Finish				
Floor Load	350 psf	350 psf	350 psf	350 psf
Column Spacing	None			
Loading Docks	12			
Drive in Doors	4			
Max. Size Door	20' h x 20' w			
Ceiling Height	30'	30'	30'	30'
Illumination				
Power & Utilities				
120V	30' o.c.	30' o.c.	30' o.c.	30' o.c.
208V	30' o.c.	30' o.c.	30' o.c.	30' o.c.
480V	90' o.c.	90' o.c.	90' o.c.	90' o.c.
Telephone	90' o.c.	90' o.c.	90' o.c.	90' o.c.
Water	90' o.c.			
Drain	90' o.c.			
Gas				
Air	90' o.c.			
CCTV	Available in meeting rooms			
P. A. System	90' o.c.	90' o.c.	90' o.c.	90' o.c.
Sound System				
Other				
Storage	20,000 sf			
Meeting Rooms				
Number	35			
Square Feet	45,000			
Occupancy	25 to 1,500			
Language Translation				
Permanent Seating Capacity				
Kitchen for Food Functions				
Restaurant				
Parking Facilities				
Fire Prevention:				
a. Sprinkler system				
b. Fire alarm system				
Air Conditioning	yes			
Pedestrian Counting				
Vehicular Counting				
Vertical Transp.	3 elevators			
Other				

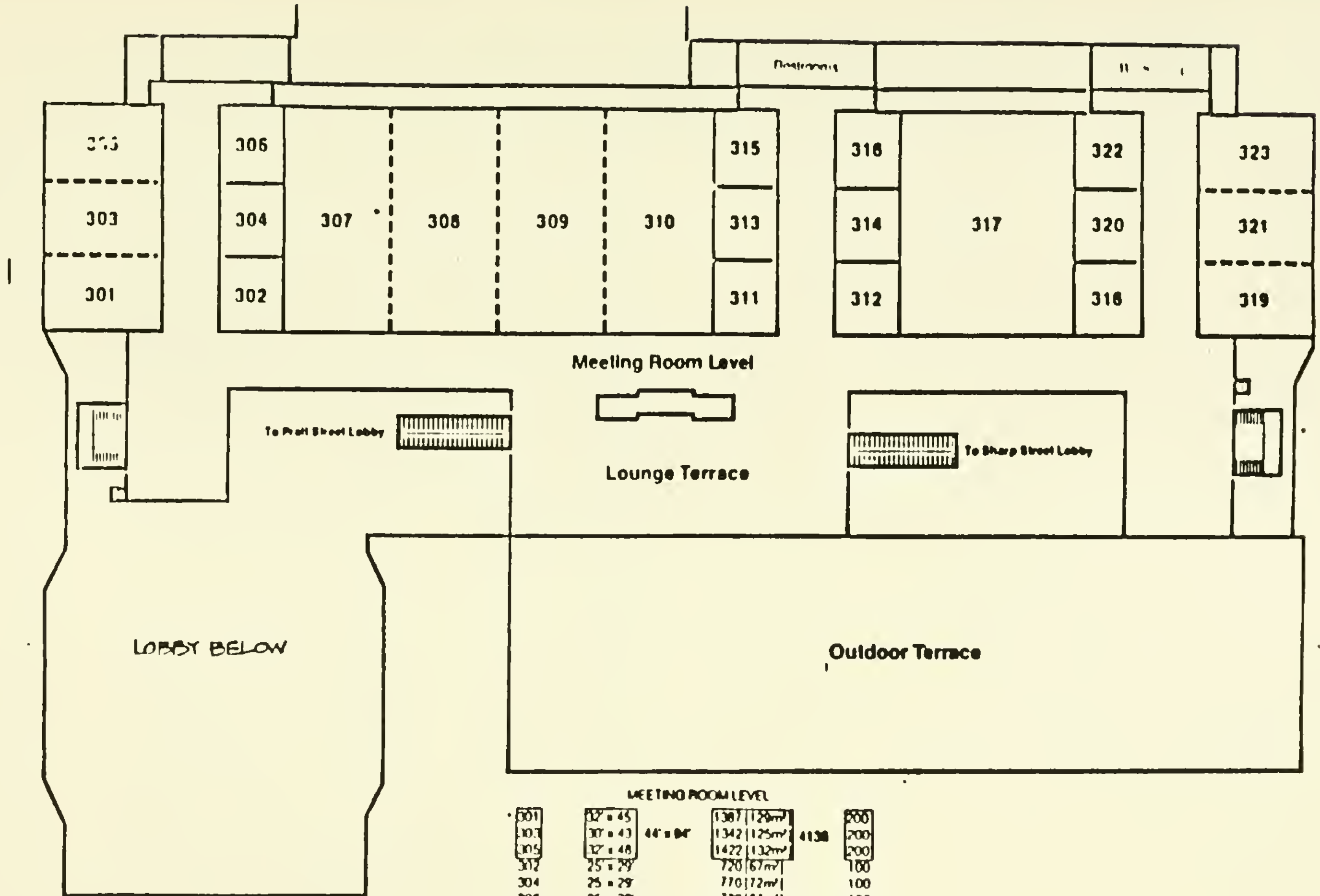


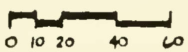
BALTIMORE CONVENTION CENTER
EXHIBIT LEVEL

MEETING ROOM	DIMENSIONS	SQUARE FOOTAGE	THEATRE STYLE SEATING CAPACITY
MEZZANINE LEVEL			
201	22 x 27	594 (1949m²)	80
202	22 x 27	594 (1949m²)	80
203	28 x 27	756 (2480m²)	100



BALTIMORE CONVENTION CENTER
MEZZANINE LEVEL





MEETING ROOM LEVEL

*301	32' x 45'	44' x 94'	1387	129m²	4138	200
303	30' x 43'		1342	125m²		200
305	32' x 48'		1422	132m²		200
302	25' x 29'		720	67m²		100
304	25' x 29'		770	72m²		100
306	25' x 29'		720	67m²		100
*307	42' x 85'	84' x 168'	3614	336m²	14186	500
308	42' x 84'		3582	333m²		500
309	43' x 84'		3665	341m²		500
310	42' x 83'		3564	331m²		500
311	25' x 29'		720	67m²		100
313	25' x 29'		770	72m²		100
315	25' x 29'		720	67m²		100
312	25' x 29'		720	67m²		100
314	25' x 29'		770	72m²		100
318	25' x 29'		720	67m²		100
317	71' x 86'		6100	567m²		600
316	25' x 29'		720	67m²		100
320	25' x 29'		770	72m²		100
322	25' x 29'		720	67m²		100
*319	32' x 45'	44' x 94'	1387	129m²	4138	200
321	30' x 43'		1342	125m²		200
323	32' x 48'		1420	132m²		200

*Combine

BALTIMORE CONVENTION CENTER
MEETING ROOM LEVEL

KALLMANN, McKINNELL & WOOD, ARCHITECTS, INC. 127 TREMONT STREET BOSTON MASS. 02108 617-482-5745

May 12, 1982

M E M O R A N D U M
Georgia World Congress Center

CONTACTS

Dan Graveline
General Manager
404/656-7600

ARCHITECTS

Thompson, Ventulett, Stainback & Associates, Inc.
Atlanta, Georgia

OPENED - September 1976

CONSTRUCTION COST

$40 million (Walter Ernst said that this was the equivalent of $70/sq. ft. in 1980 prices).

LOCATION

On a 16 acre site at the edge of downtown Atlanta, immediately adjacent to the Omni International Hotel and the Omni Coliseum.

Address: 285 International Boulevard, N.W., Atlanta, Georgia 30313.

PHYSICAL DESCRIPTION

This is a three-story facility with the three major exhibit halls on the lowest level, which is slightly below grade. The entrance level is at the upper level and contains a little less than half of the meeting rooms and the sloped floor auditorium, while the middle level is meeting rooms and breakout space. A future expansion is presently being designed which will almost double the size of the facility and incorporate a separate conference center. There will then be an entrance concourse between the two centers which will feed into the two separated halves. This new expansion will have a $74 million construction cost with $10 million additional for F/F&E, and an additional $10 million for parking and the Georgia Hall of Fame.

OPERATIONS

1. The facility is run directly by the City and none of the employees are union.

2. Dan said their goal is mid to large conventions and trade shows. One reason they want to expand to double their size is to allow two shows to be staggered back and forth so that set up and take down time of one corresponds to operation for the other. This is particularly so that the demand for hotel space

will be even rather than going in peaks and valleys. He said they have 55-65 major shows a year and only allow three public shows: boat, gift and auto.

3. They have their own sales force but the Convention Bureau basically lines up most of the prospects.

4. They operate their own laundry and do all of the cleaning. Building security is by them whereas display security depends on each exhibitor, and they feel this is a good system, allowing basically a double coverage. Dan also said that about 90% of the conventions require food service.

EXHIBITION SPACE

1. They have three major spaces of 149,000, 97,000 and 104,000 square feet. The last of these is used on occasion for very large meetings and it can seat up to 8,000.

2. Ceiling height is 30'.

MEETING ROOMS

1. They presently have 35 meeting rooms with the largest one seating up to 1,600 people. It has an 18' ceiling and provisions for simultaneous translation.

2. At present their meeting rooms have all fluorescent fixtures. The new facility will also have incandescent in order to get full dimming capability. At present they have plug in controls for the lights and other systems so that they can be controlled from podiums or other tables in the center of the room and they feel this is invaluable.

3. In addition, they have three modular meeting room set ups in Exhibit Hall C, each of which is 7,600 sq. ft. and will seat 1,160.

4. Their largest typical meeting rooms seat 400-500 people and use a split block wall which has stood up very well. Dan particularly likes it because it is impossible to tape to it, nail to it, or damage it by kicking. He did say, however, that they do need picture hanging rails.

5. In Atlanta they generally do not have back of meeting room service corridors, but have not felt that this has been a great problem.

6. Dan stressed that the equipment provided with the meeting rooms is very important. There must be a high quality of chairs, head tables with risers, lecterns, waste baskets, ashtrays, etc. All of this is provided by the Center.

7. The new addition is going to have an almost separate conference center within its meeting level floor. There will be six rooms arranged in a

roughly octagonal shape and all will have a much higher quality than the typical meeting rooms in the rest of the Center. They will also have a very high level of audio visual/close circuit TV, etc. all controlled from a central mezzanine. Two of the rooms will be of board room quality.

He said that for these corporate conferences the main criteria is isolation and high quality. He said they are aiming for the 500-1,500 person size. For smaller groups than that they would stick to the hotels themselves.

8. The new addition will also contain a ballroom of about 33,000 sq. ft. which will seat up to 5,000 or 3,300 for dinner.

<u>AUDITORIUM</u>

1. This is the only one of the centers we saw that had a sloped floor auditorium. It will seat 2,000 and is highly fitted with audio/visual having simultaneous radio translation for 6 languages. In addition, there are floor microphones at the ends of corridors. The seats are purposely kept wide at 36" centers to allow the easy access for participation by the audience.

<u>BUDGET</u>

1. Dan says their Center runs in the black with a surplus of $372,000. The reasons he gives are:

   a) A ripe market in Atlanta.
   b) A wide latitude for the introduction of profit centers free of the unions and Civil Service.
   c) 25% of their budget comes from charges for utilities - $1 million last year - which was an 80% gross profit above the cost.
   d) Food service, which last year grossed $3.5 million with a profit of 20% above cost, giving some $150,000 to $800,000.
   e) $90,000/year rental from permanent displays in the concourse.

2. The hotel tax is now 3% and they want to raise it. However, Dan added that there is a 3% sales tax which also goes on to hotel charges.

3. Dan said the rental rate is now 50¢/net sq. ft. but going to 60¢ next year. This is for five days. There's a charge of 6¢ for each additional day. He said that they generally find that the net area runs 50-60% of the gross area in the exhibit halls.

4. Dan said that there is no charge for the meeting rooms; however, they are going to charge for the new conference center and they find that many people are also already showing interest in renting the conference center for its greater amenities rather than getting the ordinary meeting rooms for free.

REGISTRATION

1. Most of the registration takes place on the middle meeting room level rather than the entrance level. Dan said they try to keep this upper level free for general circulation rather than handle registration up there.

2. On the middle level there are look-overs in two locations which look out on to the two major exhibit halls.

GENERAL

1. Dan said that one thing that they are introducing in the new addition is a "meeting point". They think this will be extremely useful as giving a point of definition for people to meet, and said that basically such things exist in all European centers. It needs a graphic symbol such as a clock, sculpture, etc. in order to define it.

Henry A. Wood

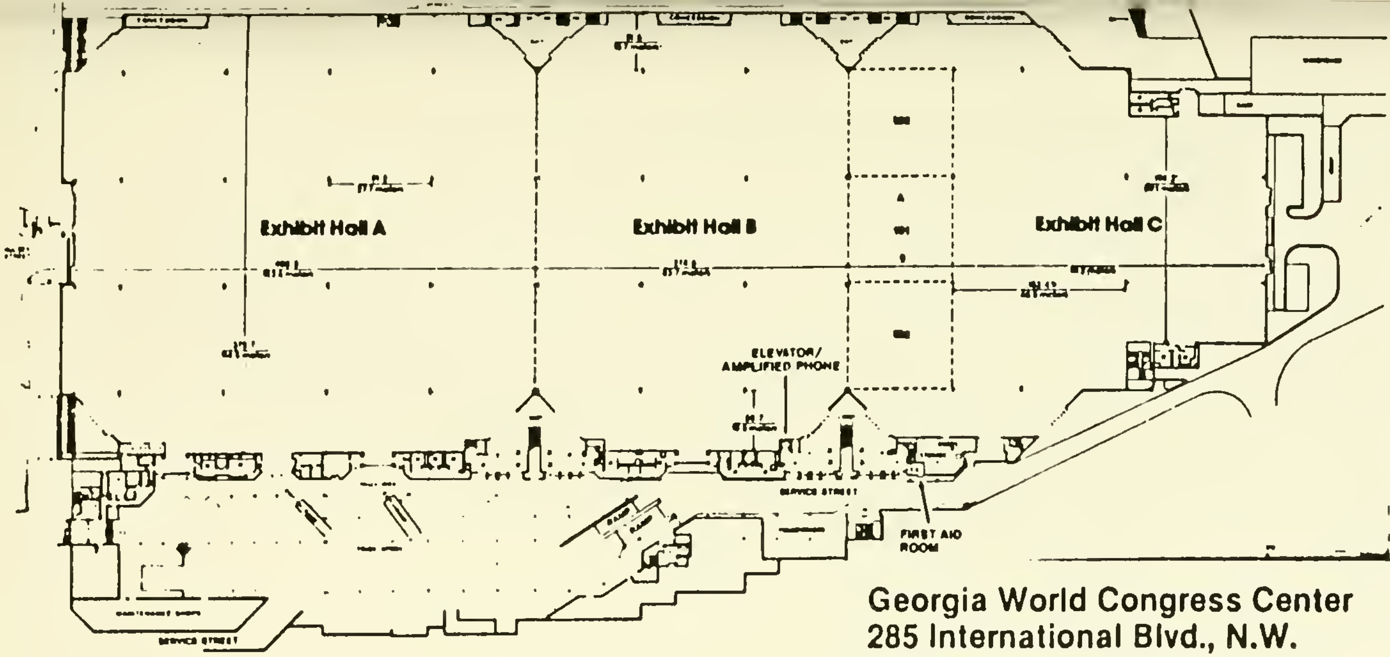
Exhibition Center: GEORGIA WORLD CONGRESS CENTER
181 WASHINGTON STREET S.W.
ATLANTA, GEORGIA 30303

General Manager: DAN GRAVELINE
Telephone: (404)656-7600

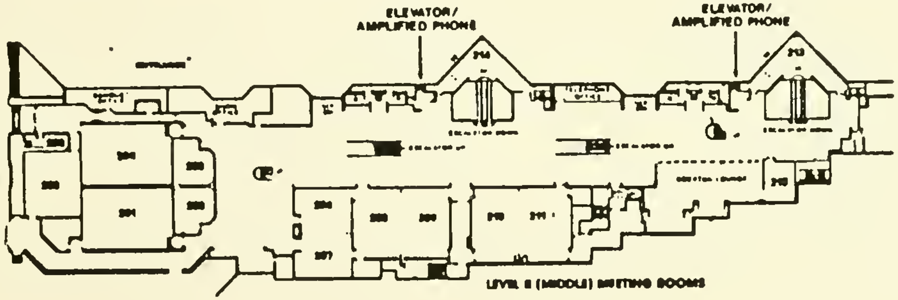
40
Atlanta

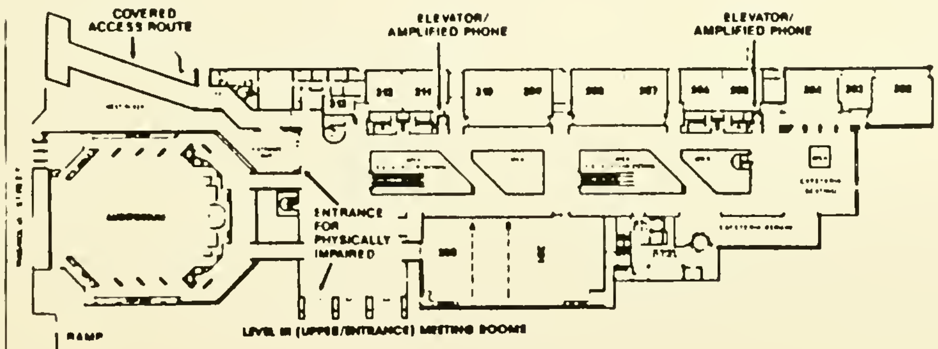
Exhibition Space - Total Square Footage: 350,000
Estimated Number of Visitors per year:

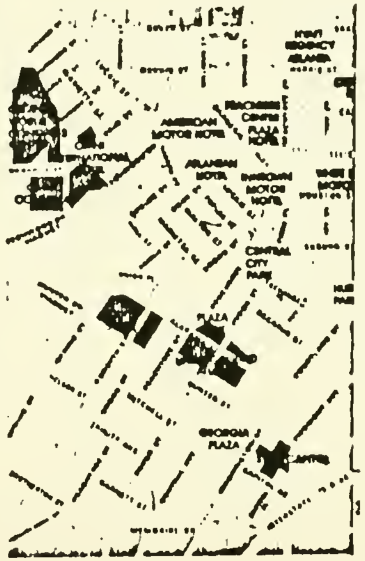
	Section "A"	Section "B"	Section "C"
Exhibit Area Square Footage	149,000	97,000	104,000
Floor Finish			
Floor Load	350 psf	350 psf	350 psf
Column Spacing	91' o.c.	91' o.c.	150' o.c.
Loading Docks	19		
Drive in Doors	7		
Max. Size Door	28' h x 20' w		
Ceiling Height	30'	30'	30'
Illumination			
Power & Utilities			
120V (110)	Available as required		
208V	Available as required		
480V	Available as required		
Telephone	30' o.c.		
Water	Available as required		
Drain	Available as required		
Gas	Available as required overhead		
Air	Available as required		
CCTV			
P. A. System			
Sound System			
Other	Available as required overhead		
Storage	20,000 sf		
Meeting Rooms			
Number	35		
Square Feet	200,000 sf		
Occupancy	50 to 2,000		
Language Translation			
Permanent Seating Capacity	1952 in auditorium		
Kitchen for Food Functions	Banquet for 10,000		
Restaurant			
Parking Facilities			
Fire Prevention:			
a. Sprinkler system	Yes, entirely		
b. Fire alarm system			
Air Conditioning	Yes		
Pedestrian Counting			
Vehicular Counting			
Vertical Transp.	2 passenger @ 4000#, 1 freight @ 8000#, 12 escalators		
Other			



Georgia World Congress Center
285 International Blvd., N.W.
Atlanta, Georgia 30313







ROOM #	THEATER CAPACITY	CLASSROOM CAPACITY	BANQUET CAPACITY	OVERALL DIMENSIONS FEET	OVERALL DIMENSIONS METERS	USABLE AREA SQ FT	USABLE AREA SQ METERS	CEILING HEIGHT
100	1100	540	540	85 x 90	25.9 x 27.4	7 650	709.98	[illegible]
101A	550	270	270	85 x 45	25.9 x 13.7	3 825	354.63	[illegible]
101B	550	270	270	85 x 45	25.9 x 13.7	3 825	354.63	[illegible]
101A/101B	1100	540	540	85 x 90	25.9 x 27.4	7 650	709.98	[illegible]
102	1100	540	540	85 x 90	25.9 x 27.4	7 650	709.98	[illegible]

NOTE: Congress Center is equipped with 900 linear feet of portable wall paneling. Panels may be utilized to divide exhibit halls or create exhibit floor meeting rooms, or some combination thereof.

LEVEL II (MIDDLE) MEETING ROOMS

ROOM #	THEATER CAPACITY	CLASSROOM CAPACITY	BANQUET CAPACITY	OVERALL DIMENSIONS FEET	OVERALL DIMENSIONS METERS	USABLE AREA SQ FT	USABLE AREA SQ METERS	CEILING HEIGHT
200	413	102	180	48 x 60	14.6 x 17.9	2 880	263.79	15' 7"
201	800	290	320	63 x 75	19.8 x 24	4 363	405.32	18' 1"
202	167	68	80	37 x 37.0	11.3 x 11.4	1 298	120.58	17' 1"
203	168	68	80	37 x 37.5	11.3 x 11.4	1 298	120.59	17' 1"
204	800	288	320	63 x 79	18.3 x 24.1	4 388	408.07	18' 1"
205	74	40	40	18 x 31	5.5 x 9.5	504	56.11	11' 9"
206	349	110	120	37 x 51	11.3 x 15.5	1 879	168.81	18' 0"
207	349	110	170	37 x 51	11.3 x 15.5	1 879	168.81	18' 0"
206/207	403	330	240	74 x 51	22.6 x 15.5	3 048	310.31	18' 0"
208	364	166	180	43.6 x 58	13.3 x 17.7	2 479	230.30	18' 0"
209	364	188	180	43.6 x 58	13.3 x 17.7	2 479	230.30	18' 0"
208/209	773	333	360	87 x 58	26.5 x 17.7	4 958	460.60	18' 0"
210	380	178	160	44.3 x 63	13.5 x 19.2	2 643	245.53	18' 0"
211	380	178	180	44.3 x 63	13.5 x 19.2	2 643	245.53	18' 0"
210/211	728	363	380	89 x 63	27.1 x 19.2	5 287	491.16	18' 0"
212	117	70	80	27.6 x 35	8.4 x 10.7	957	88.90	11' 10"
213	204	100	120	SEE PLAN		2 070	193.06	[illegible]
214	204	128	120	SEE PLAN		2 078	193.06	[illegible]

LEVEL III (UPPER/ENTRANCE) MEETING ROOMS

ROOM #	THEATER CAPACITY	CLASSROOM CAPACITY	BANQUET CAPACITY	OVERALL DIMENSIONS FEET	OVERALL DIMENSIONS METERS	USABLE AREA SQ FT	USABLE AREA SQ METERS	CEILING HEIGHT
300A	400	310	230	47 x 74	14.3 x 22.5	3 138	291.34	17' 7"
300B	860	380	380	74 x 74	22.6 x 22.5	5 408	502.40	17' 7"
301A	862	800	620	111 x 74	33.8 x 22.5	8 081	749.97	17' 3"
301B	826	380	390	84 x 74	25.6 x 22.5	5 796	537.70	17' 3"
300/301	1600	770	750	160 x 74	48.3 x 22.5	11 196	1 040.11	17' 3"
302	486	276	230	49.6 x 68	15.1 x 21.0	3 396	345.39	16' 0"
303	129	64	80	30 x 34.6	9.1 x 10.5	972	90.29	13' 7"
304	180	90	90	41 x 36.6	12.5 x 11.1	1 480	138.02	14' 10"
305	174	78	90	40 x 36.6	13.1 x 11.0	1 438	183.73	16' 0"
306	133	64	90	33 x 36.6	10.3 x 11.6	1 130	122.22	16' 0"
305/306	340	140	170	35.6 x 72	33.8 x 11.0	2 880	214.84	16' 0"
307	277	130	140	40.6 x 40	18.1 x 12.2	2 064	190.03	14' 9"
308	277	130	140	40.6 x 44.6	18.1 x 13.5	2 064	190.02	14' 9"
307/308	560	364	280	40.6 x 94.6	18.1 x 28.7	4 10C	381.03	14' 9"
309	263	120	130	49.6 x 39	18.1 x 11.8	1 903	176.78	16' 2"
310	262	120	130	49.6 x 39	18.1 x 11.8	1 903	176.78	16' 2"
309/310	524	240	260	49.6 x 78	18.1 x 23.8	3 906	363.56	16' 2"
311	187	78	80	38 x 43	10.9 x 13.9	1 133	105.28	16' 1"

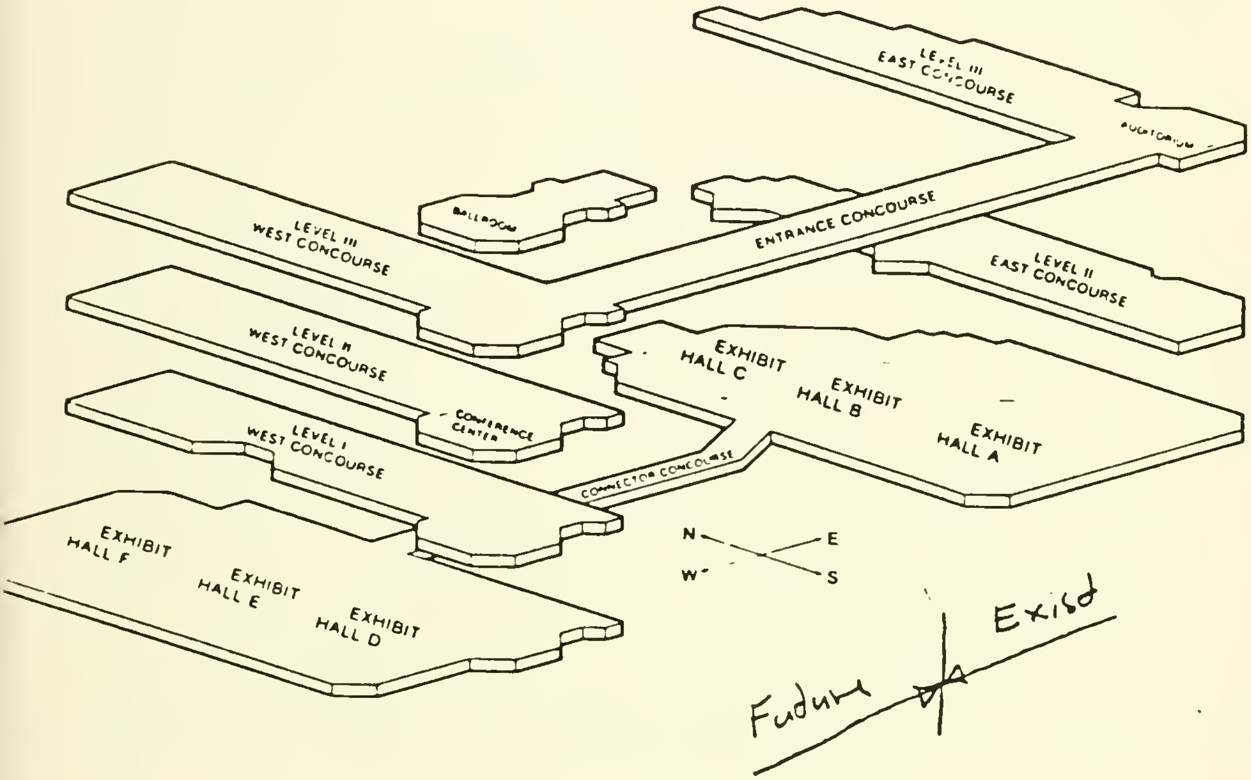
LEVEL III AUDITORIUM

Auditorium	Continental Seating for 1[illegible]

EXHIBIT HALL

Exhibit Hall A	149 000 SQ FT	13,842 SQ METERS
Exhibit Hall B	97 000 SQ FT	9,011 SQ METERS
Exhibit Hall C	104 000 SQ FT	9,662 SQ METERS
Total	350 000 SQ FT	32,515 SQ METERS

Georgia World Congress Center
285 International Blvd., N.W.
Atlanta, Georgia 30313



KALLMANN, McKINNELL & WOOD, ARCHITECTS, INC. 127 TREMONT STREET BOSTON MASS 02108 617-482-5745

May 12, 1982

M E M O R A N D U M
George R. Moscone Convention Center, San Francisco, California

CONTACT

Richard H. Shaff
Vice President and General Manager
Facilities Management Incorporated of California
415/957-0393

ARCHITECTS

H.O.K.

OPENED - December 1981

CONSTRUCTION COST

$91 million

LOCATION

In downtown San Francisco, but off from the main business and hotel areas.

PHYSICAL DESCRIPTION

This facility,by City referendum,is entirely below ground, except for the entrance/ lobby space. The meeting rooms are in mezzanine wings on either side of the lobby and just below ground, whereas the exhibition hall is 40' below grade.

They are already planning to add to the facility, particularly in meeting rooms, which they find at present limits the number of professional type conventions they can have. They are planning to add 75,000 sq. ft. at the plaza roof level.

OPERATIONS

1. This facility is managed under contract by FMI (Facilities Management Incorporated of California).

2. At present they have 100 full time employees and have found that there is not enough space allocation for lounges, lockers, etc.

3. They find much of their appeal is to high technology and professional shows. Their capacity is 162 event days which corresponds to 320, 330 salable days. This appears to be standard within the industry, particularly it is almost impossible to get shows in December and January.

4. Bookings are handled by the San Francisco Convention Bureau, except that Dick can book any open dates within an 18 month period. They presently have very few gate shows - only boat, home, garden and computer.

5. At present they do not have a computerized registration system but think that one probably will be installed. They do, however, tie in to 13,000 hotel rooms by cable and are probably going to tie in to the City cable system. The eventual hope is to be able to tie in in such a way that they can go to the hotel rooms of only those people registered at the convention.

6. Dick said that they generally don't have two conventions at the same time, as their lobby just isn't big enough to handle two simultaneous registrations and it cannot be easily divided.

7. Dick said that there are many problems by having everything so far underground. In particular, he said that they have to devote 25% of their area for circulation to meet life safety requirements, etc.

8. Although Dick said they have their own sales budget, they do not really have a sales force out on the street. They have three event coordinators, one of whom will be assigned to each show in the facility and one full-time booking coordinator.

9. They do handle large public events and have their first rock concert coming up soon and anticipate 18,000 coming. They are also trying for the Democratic National Convention. The biggest they've had so far was 12,000 at a gay/lesbian celebration. They have also had a big event for hookers and exotic dancers.

10. They have a large central kitchen adjacent to the ballroom with three elevators serving it. Dick said, however, they have a problem with not enough cold storage space.

11. One of the original problems they had with the program was not enough telephone space. Originally, they had 16, now they have 64 phones on the exhibit level.

EXHIBITION HALLS

1. There is a total exhibit hall of 261,000 sq. ft., which is divisible into three halls. There is a set 37' ceiling height.

2. There is, however, quite a problem with the utility boxes on the floor. They are almost on a random grid due to construction problems when the electrician moved all the boxes because of conflicts with the post tensioning ties between the supporting arches. There has also been a continuing problem with water leakage, as they are 11' below the water table.

3. There are in addition 4 utility tunnels that run underneath the floor through which services can be pulled. There are then raceways that feed to all of the floor boxes, however, all of them had to be fire stopped per the Fire Department, and they have lots of problems with them.

4. There is a permanent bar in addition to the regular concessions off the exhibit halls, however, they've found the bar much too stark and they are going to review it completely. Dick felt rather strongly that there should be a permanent bar within the facility and also a permanent real restaurant rather than just concessions. He said there is a lot of desire among conventioneers to get off the exhibit hall but not have to leave the facility itself.

MEETING ROOMS

1. The ballroom is really three dividable rooms off the exhibit space which total 30,000 sq. ft. They use it for exhibition space as well as banquets. It holds up to 3,000 people theater style or 2,200 - 2,400 for banquets. It has 19' ceilings. The floor is carpet, and they have found this a total disaster because it is so often used for exhibit space. For banquet purposes they figure 15 sq. ft./person and usually try to work 8 per table rather than 10.

2. On the meeting room level the larger spaces have 18' ceilings, whereas the smaller ones at the back of the facility have 9' ones.

3. The square blocks L and Q can be divided into 7 smaller spaces, however, the smallest ones they really feel are too small to be useful for anything except offices.

4. The movable partitions are made by IAC which used to be considered the best in the industry, but Dick has found that the quality has deteriorated considerably, particularly with the hydraulic foot jack that makes the seal at the bottom.

5. All of the lighting is fluorescent, however, they have used a Decor matrix control which allows an almost infinite variety of on/off combinations. They have, however, found it much too complicated to be practical and really need full dimming.

6. There is no service corridor service for the meeting rooms except for the ballroom at the lowest level and there doesn't seem to be a problem in this regard.

7. Dan said that there is heavy audio/visual usage in almost all of the meeting rooms and that dimming is absolutely essential. He says that they do not use any permanent projection screens in any of their spaces.

SERVICE

1. Dick said they have five loading docks at each side in the basement and in addition two drive on entrances to the floor. He said this does suffice but without the drive on provision the docks themselves wouldn't.

---

2. Dick said the long ramp to get from the street level down to 40' to the exhibit space is their only real bottleneck. He said they end up with a tremendous amount of marshalling trucks right on the adjacent streets. Originally they had rented a marshalling yard about four blocks away, but it was just too far away for anyone to use it, and they finally gave up the rental all together.

3. Dick said their storage facilities are so tight that they have to move all the crates out and can't leave them within the facility. He said that they even have to go to the extent of using the loading docks for all of their chair storage.

REGISTRATION

1. Dick said that all registration takes place in the upper lobby, which is about 15,000 sq. ft. He says he has had a problem with this just being too tight for some of the conventions. For example, he said that opthomology required 30,000 sq. ft.

BUDGET

1. There is a 9-3/4% hotel tax of which 1-3/4% goes for Candlestick Park. The San Francisco Convention Facilities receive about half of the remaining or 4%. ABout $2.5 million goes to the Convention Bureau. He said their overall operating budget is about $6 million with $3 million revenue giving a $3 million deficit predicted for next year.

2. Dick said that food and drink concessions grossed about $2 million for the first six months of operation. In addition, he said that the shoe shine facility has turned out to be a very good profit center and they get some little bit from the vending machines.

3. Their charges are 8¢/day per net square foot with a move in and out day. They are also provided free meeting rooms with one set up per day.

MAINTENANCE

1. Dick spent a lot of time talking about the problems he has with maintaining many of his finishes and surfaces. He attributes much of this to too much "high design" and particularly the woman for HOK that was in charge of the materials.

2. He said in particular the carpeting was a disaster. The pattern was not strong enough to hide all of the dirt and he says they are forever cleaning and spotting it. He says that it looks like it's four years' old when it's only six months. Another problem they have is "sprouting" at all joints. This is apparently what happens when you have a seam and there is a tendency for the carpet to rise up at this point. Their real problem here is on the meeting room level - there is a darker carpet border carried in all of the public areas which adds greatly to the number of seams.

3. He also said that the granite floors give them a lot of problem in that they pick up stains very easily. He said the are going through considerable expense to clean them with some special solutions and then sealing them off. He felt that the roughness of the granite floor also contributes to their dirt-holding ability and destroys the brushes on their scrubbers. The granite floor is in the entrance lobby and registration areas.

4. Dick said they have lots of problems with wall finishes - that the architect had called for flat paint. They are now adding an eggshell wainscot in all public areas. He said that at the facility they had run before in Long Beach they had carpet walls which worked out very well. However, he said in San Francisco the Fire Department wouldn't allow them.

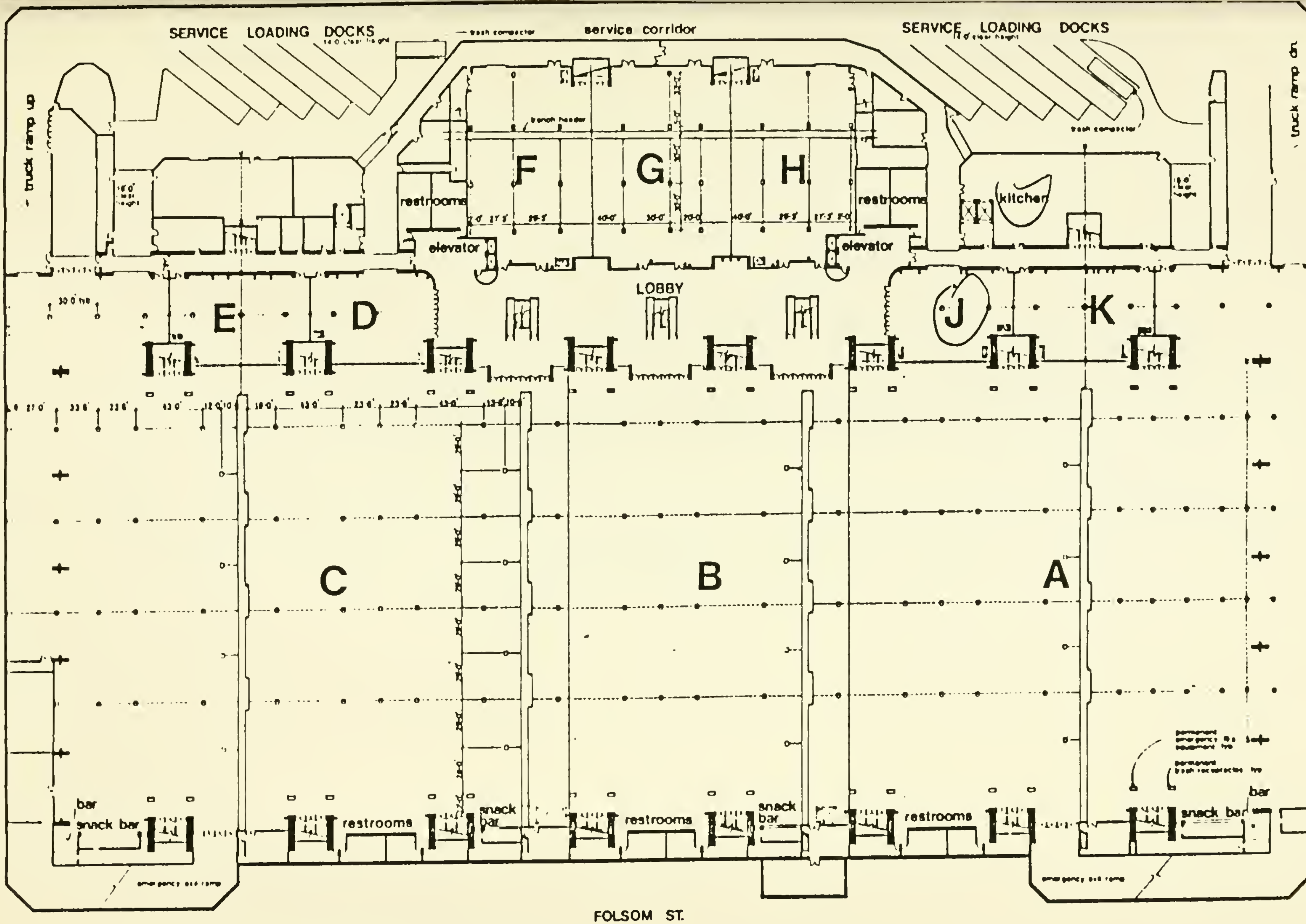
5. Dick said he is also adding plexiglas wainscots at phone areas where the walls have not stood up at all and also as pushplates on the doors. The high polished chrome finish kickplates on the doors also give a lot of problem in that they always look messy.

GENERAL

1. On the exhibition floor there are on both sides free-standing "PERS" boxes which are permanent emergency rescue and security devices which contain firehose, fire extinguisher, fire alarms - both to their security office and the Fire Department, and emergency phones, as well as phones for convention control. There are 79 of these in all and they say they work out extremely well. Similar ones are also located in walls on the meeting room floor.

2. There is a family of pigeons that lives within the exhibition space on top of the big concrete arches.

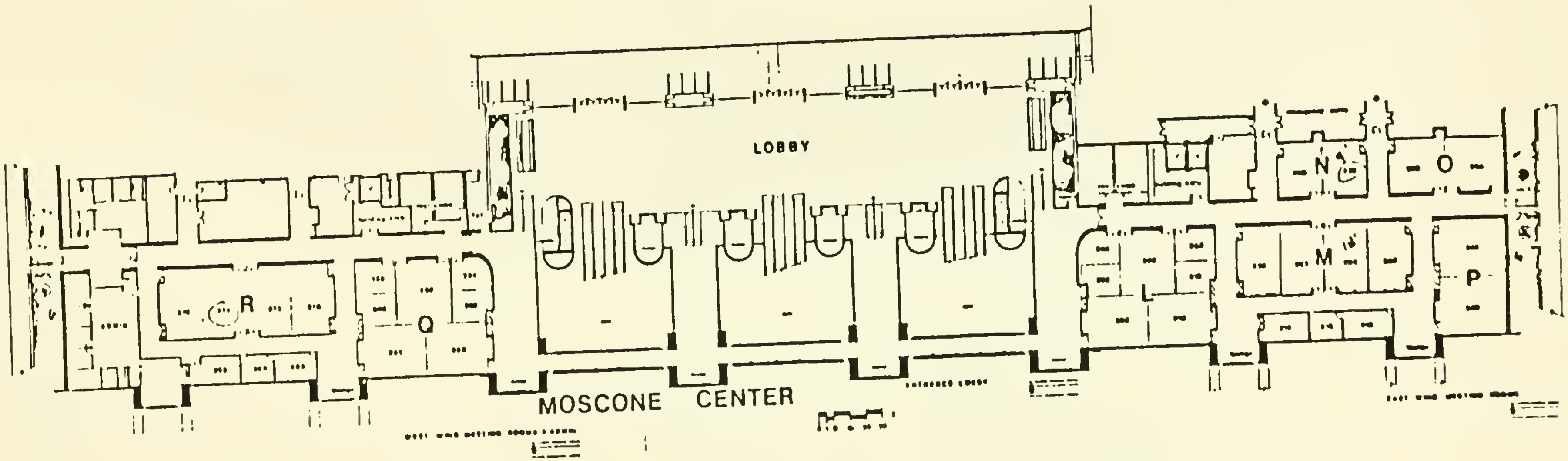
Henry A. Wood



MOSCONE CENTER

date: december, 1980

floor box & cellular deck
electrical outlet
operable wall
operable wall storage
utility tunnel



LOBBY
R
Q
N
O
M
P
MOSCONE CENTER

AUTHOR
Hynes AuditoriumExpansion..

TITLE
Final Report(Vol.I)

DATE LOANED	BORROWER'S NAME